

A TAXONOMIC REVISION OF THE GENUS *MACROLOBIUM*
(LEGUMINOSAE-CAESALPINIOIDEAE)¹

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INTRODUCTION

Macrolobium is one of nearly a hundred genera of the subfamily Caesalpinoideae (Leguminosae), and with about twenty other genera comprises the tribe Amherstieae. The subfamily is exceptionally well developed in tropical America and many of its South American representatives are greatly in need of study. Such genera as *Swartzia* (tribe Tounateae) and *Cassia* are quite confused taxonomically but are such immense groups that their study must be undertaken over a long period. The same sort of complexity has existed, to a lesser extent, in *Macrolobium*, which is sufficiently smaller so that a more immediate solution of its taxonomy appeared possible. In the course of routine identifications of the legumes from Venezuela, the writer became especially interested in this genus because of its morphological diversity and he became convinced that it was in need of critical investigation because of the difficulty encountered in naming these collections. Such a revision could profitably be undertaken at the New York Botanical Garden because of the considerable collections of the genus, including much type material, on deposit there.

What *Macrolobium* lacks in numbers of species is compensated for in numbers of individuals, for in some areas in Venezuela the author has observed riverine vegetation in which the commonest trees were members of this genus. It is found from northern Panama south to Peru on the western coast of South America and to southern Brazil on the Atlantic Coast. It is predominantly a genus of lowland riverine or savanna plants, but the species of section *Stenosolen* occur in the foothills on both sides of the Andes. The lands annually inundated by the overflow of rivers during the rainy season are a frequent habitat, but many species prefer the sandy savanna and sub-savanna areas. Certain taxa of the genus were observed by the writer growing only in the vicinity of rapids, but this must surely be an edaphic correlation.

Concurrently with the study of the materials of the genus in the herbarium of the New York Botanical Garden, loans were obtained from the major herbaria of the world which contain appreciable numbers of South American collections. These herbaria are listed below with the abbreviations used in the text, which are, for the most part, taken from the list by Lanjou (1952).

A—Arnold Arboretum, Jamaica Plain, Massachusetts.

BM—British Museum (Natural History), London, England.

BGF—British Guiana Forest Department, Georgetown, British Guiana.

COL—Instituto de Ciencias Naturales, Bogotá, Colombia.

F—Chicago Natural History Museum, Chicago, Illinois.

G—Conservatoire et Jardin Botanique, Geneva, Switzerland.

GH—Gray Herbarium of Harvard University, Cambridge, Massachusetts.

IAN—Instituto Agronômico do Norte, Belém, Brazil.

K—Royal Botanic Gardens, Kew, England.

MO—Missouri Botanical Garden, St. Louis, Missouri.

¹Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, in the Faculty of Pure Science, Columbia University.

NY-New York Botanical Garden, New York, New York.

P-Muséum National d'Histoire Naturelle, Laboratoire de Phanerogamie, Paris, France.

RB-Secção de Botânica Sistemática, Jardim Botânico do Rio de Janeiro, Rio de Janeiro, Brazil.

U-Botanisch Museum en Herbarium van de Rijksuniversiteit te Utrecht, Utrecht, Netherlands.

UC-University of California Herbarium, Berkeley, California.

US-Smithsonian Institution, U. S. National Museum, Washington, D. C.

VEN-Division de Botánica, Ministerio de Agricultura y Cria, Caracas, Venezuela.

W-Naturhistorisches Museum, Botanische Abteilung, Wien, Austria.

Y-Yale University School of Forestry, New Haven, Connecticut.

The author is much indebted to the directors and curators of all these institutions, from which specimens have been borrowed. He gratefully acknowledges the invaluable assistance of the following persons: Dr. Bassett Maguire, under whose direction this research was conducted and who contributed extensively with his encouragement and suggestions; Dr. David D. Keck and Dr. D. P. Rogers, who have contributed liberally of their time in the preparation of the manuscript and in the evaluation of the botanical conclusions during the absence of Dr. Maguire in South America; and Dr. H. W. Rickett, for kind assistance in editorial and bibliographic matters.

GENERIC RELATIONSHIPS

The tribe Amherstieae, while pantropic in distribution, is best represented in tropical South America and tropical West Africa. There are fewer genera of the tribe in South America than in Africa and they bear little resemblance to *Macrolobium*, whose closest relatives are certainly African. *Macrolobium*, as heretofore circumscribed, appears to be most closely allied to the African genus *Berlinia*, although the American species are strongly dissimilar, and the connection with this genus is through the African species of the *Macrolobium* complex. The relationship with other members of the Amherstieae is even more remote.

Although the geographical range of *Macrolobium* has always been considered to include tropical West Africa, recent developments have modified this view, at least for the writer. A letter from Dr. J. Léonard of Institut National pour l'Étude Agronomique du Congo Belge, Brussels, explained that he was completing a study of the African species of *Macrolobium* and he enclosed an impressive synopsis of his conclusions in the form of keys, tables, descriptions, and sketches. He explained that he was segregating two new genera from the African material and that he considered the remainder of the species under two subgenera of *Macrolobium* with the American species as a third subgenus. He asked consideration of his conclusions and especially that the characters be checked which he considered as significant in separating his various taxa, since he was less familiar with the American species. As I had not reviewed the African situation, I was pleased to have this opportunity of examining his work.

After careful examination of the differences involved, the following table of significant characters separating the species of America and Africa was submitted to Dr. Léonard, the points arranged in descending order of importance:

<i>American Species</i>	<i>African Species</i>
1. Petal one.	1. Petals (4-)5(-6).
2. Staminiodia usually absent.	2. Small stamens and/or staminiodia 4-7.

- | | |
|--|---|
| 3. Foliar axis usually narrowly alate. | 3. Foliar axis non-alate. |
| 4. Claw of petal usually auriculate. | 4. Claw not auriculate. |
| 5. Fruit always smooth. | 5. Fruit smooth or with transverse lines. |

In a second letter, Dr. Léonard suggested that the number of petals, presence or absence of staminodia are the important characters which with the geographic distribution serve to separate these groups of species. He referred again, however, to the American species as possessing one large petal, sometimes accompanied by one to four small petals. The present writer considers the latter not as "small petals" but petalodia, that is, vestigial remnants of petals.

The point, morphologically, at which a petal becomes a petalodium is indeed obscure, but anatomical evidence has led the writer to the conviction that these bodies are more properly referred to as vestigial structures. Several of the American species were studied by means of transverse serial sections, and while the one large adaxial petal had a very obvious vascular supply in all the flowers of the few species studied, no sign of bundles for either vestigial petals or staminodia was observed. Whether or not the more prominent petals of the African species have a vascular system is not known, but in the American ones it appears that there is not more than one vascularized petal and furthermore the vestigial non-vascularized ones are deciduous at anthesis if formed at all and in any case are seldom observed.

Recently it was decided to attempt to secure additional data which might assist in the resolution of this problem of generic delimitation. Accordingly, Dr. G. Erdtman of the Palynological Laboratory at Bromma, Sweden, was asked to make available any information which he might have on this genus. He very kindly offered to undertake a study of the pollen morphology of the genus; for this immeasurable assistance I express my sincerest appreciation.

Material of thirteen African and nine American species was sent to Dr. Erdtman for his study. A preliminary report was received within a few weeks, with the statement that "the grains can be classified in two groups: South American species and African species." He pointed out that in both species-groups the sexine is conspicuously striate but that the striae in the American species are much more densely spaced than those of the African species. Further differences were found in the form of the striae and in the relative length of the baculae. These characters are apparently constant for each species-group, and, while microscopic, they lend valuable support to the arguments for maintaining the African and American species in separate genera.

In summary, Dr. Léonard contends that the occasional presence of "petals" and staminodia in the American species form a bond with the African species with their five petals and omnipresent small stamens and/or staminodia, for which reason they should be considered congeneric. The present writer maintains that the characters enumerated in the table above and the palynological characters are sufficient for the generic separation of these two groups. *Macrolobium* is here considered to be an American genus with its closest relatives the species in Africa formerly assigned to it; whether these latter species be referred to one genus or more than one is a problem for the students of the African floras to resolve.

HISTORY OF THE GENUS

Aublet in his publication on the plants of French Guiana (1775) described two new genera, *Vouapa* and *Outea*, the former with two species and the latter with one. *Vouapa bifolia* is recognizable from the description and plate, but the second species, *V. Simira*, is probably not congeneric. Although the type of *Outea guia-*

nensis has not been seen, there are two subsequent collections from Surinam which match Aublet's plate well and are accepted as representing this taxon.

Scopoli renamed *Vouapa* in 1777, calling it *Kruegeria*, and in 1789 Schreber included both *Vouapa* and *Outea* under a new name, *Macrolobium*, which gained general acceptance. In 1805 J. St.-Hilaire and in 1891 Taubert used Aublet's original generic names, but St.-Hilaire changed their spelling to *Vuapa* and *Utea*. The legitimate generic name was finally resolved by legislative action in the conservation of *Macrolobium* against *Outea*, *Vouapa*, and *Kruegeria* in 1935.

Between 1775 and 1870 very little was added to the knowledge of the genus aside from the descriptions of a few new species and the renaming of some of the older ones. Vogel (1837) described two new species, *M. pendulum* and *M. latifolium*, and at the same time created two sections. His first section included both *Vouapa* and *Outea* but he presented no name for it; the second section, which he called *Scytodium*, included only his new species, *M. latifolium*.

By 1870 some nine species had been proposed, and in that year Bentham published the first critical study of the genus in *Flora brasiliensis*, adding a number of new species based on Spruce's collections in Brazil. In this review he recognized only the name *Macrolobium*, relegating *Outea* and *Vouapa* to synonymy.

The following years witnessed the addition of numerous new species as northern South America became better known floristically. Both O. Kuntze and Taubert in 1891 placed most of the then known species in the genus *Vouapa* ("Vuapa" of Kuntze). Of more consequence was the treatment of the genus by Britton and Killip (1936). In this publication these authors maintained *Outea* as a genus distinct from *Vouapa*, the latter being considered as a synonym of *Macrolobium*. At the same time they established a new genus, *Pseudovouapa*, to include the single species *M. stenosphon* Harms. The writer has found no morphological grounds for the recognition of *Pseudovouapa* and it is accordingly treated here as a synonym of *Macrolobium*. To be sure, there are abundant differences to distinguish its type species from all other species in the genus, but none is of generic magnitude.

Both Ducke and Pittier presented reviews of the genus (1941). Ducke's treatment included only the species of the "Amazonian Hylaea," and in it he presents keys to the species, general remarks concerning the plants, and the citation of Ducke collections. Pittier's review was somewhat more complete but included only the species of Venezuela. He included keys, brief descriptions, citation of a few specimens for each species, and the descriptions of three new species, one of which was conspecific with an earlier species.

Miss Amshoff (1948), working at Utrecht on Maguire's legume collections from Surinam, published the descriptions of two new species and one new variety; she also gives a key, but only to the species of Guiana.

MORPHOLOGY

Habit. Both shrubs and trees occur and each taxon is rather constantly of one or the other form. The minimum stature is realized in *M. savannarum*, which is characteristically a low shrub, often less than a meter in height when fully mature. At the other extreme, individuals to 35 m. tall were recorded by Krukoff for *M. campestre* var. *arboreum*. Many of the arborescent species have a spreading, more or less flat-topped crown.

Stipules. These structures occur in pairs at the base of the petioles but are most frequently caducous; in a few taxa (*M. huberianum* and *M. pendulum*) their persistence has been a useful character. In form, they vary from small subulate structures to large foliaceous ones; where possible their form and size have been used in the taxonomy of the genus, for both characters are quite stable.

Petiolules. Petiolules are infrequent and when present constitute a very usable characteristic; a few isolated examples occur in each of the sections. The term is herein applied to that portion, when present, of the leaflet below the last sensible trace of the blade.

Rachis Rudiment. In a few of the unijugate species, *M. pendulum* for example, the last vestige of the rachis persists as a subulate structure as much as a centimeter or more in length. It is generally caducous, but in the species named it is persistent or semi-persistent.

Leaflets. In form and dimensions there is the greatest diversity in these parts. In the more primitive species the form is mostly oblong and it is in the more highly evolved forms that other shapes occur. Both size and shape of the leaflets have been used systematically, but of greater importance is the number of pairs per leaf. They are always opposite and always in pairs except in some forms of *M. campestre* in which one of the leaflets of the terminal pair does not develop; the latter condition is referred to as pseudo-imparipinnate. The evolutionary tendency is toward a progressive reduction in the number of pairs with usually a corresponding increase in the leaflet size. However, this tendency has been expressed repeatedly and independently of all other characters.

The details of the venation are so uniform that they seldom furnish useful characters. However, characters of secondary importance are found in the degree of prominence of the costa (the "midrib" of the leaflet); in *M. limbatum* the primary vein branches (the first-degree branching of the costa) anastomose intramarginally to form a distinct submarginal vein, and such intramarginal nerves are also found in *M. retusum*. In *M. furcatum* and *M. flexuosum* the venules (the venation other than the costa and primary veins) are prominent, numerous, and closely parallel.

The vesture of the leaflets is quite variable and is used infrequently in the following treatment. The leaflets may be entirely glabrous or pubescent only on the costa or throughout. The under surface is commonly, but not always, covered by a persistent microscopic waxy bloom.

In a few taxa glandular punctae are present and are sufficiently constant to justify their use as a taxonomic character. These glands occur as small punctations of regular form and of uniform distribution over the lower leaflet surface.

Inflorescence. The inflorescence may be axial or terminal and ramiflorous or cauliflorous; the latter pair of characters is particularly useful taxonomically on the specific level. It is always racemose but considerably variable in dimensions and outline. In *M. furcatum* one or two short lateral racemes occur regularly toward the base of the inflorescence, but these are rare in other taxa.

The peduncle of the inflorescence is generally very short or absent but in *M. multijugum* and *M. molle* one as long as five centimeters is produced, which serves to distinguish these species.

Bracts occur regularly at the base of each pedicel, but these vary from minute, insignificant structures to those which surpass the flowers in length. They frequently furnish characters of some systematic importance in their size, form, and vesture. They are most frequently very early caducous but are persistent in several taxa; in *M. parvifolium*, for example, they persist as a wide band of imbricate sterile bracts at the base of the inflorescence.

The flowers are always borne on pedicels, at the apex of which are found two bracteoles which are connivent marginally to enclose the flower before anthesis. These bracteoles are variable in form not only between but also within taxa, but for taxonomic purposes they are much more reliable in their dimensions. At anthesis they open to the base along an adaxial and an abaxial line, releasing the

infolded petal, stamens, and style. However, in section *Stenosolen* they open completely abaxially but only partially along the adaxial line (Fig. 1e). In the less highly evolved taxa the bracteoles are generally pubescent on both surfaces, but in more advanced groups they are pubescent on only one surface or entirely glabrous.

Flowers. The flower is composed of a hypanthium, four or five sepals, one petal, three stamens, and a single pistil (Fig. 1). The hypanthium, which is either sessile or stipitate, is here quite likely the result of the fusion of the bases of the filaments, the calyx, and possibly of the petal. It is either cupular or long-cylindric, and this difference is of first importance in distinguishing the two sections. It is cylindric and regular or nearly so in section *Stenosolen* but cupular and more or less zygomorphic in section *Vouapa* (Figs. 1a, e).

On the margin of the hypanthium are borne the sepals, petal, stamens, and sometimes the pistil as well. The calyx of section *Stenosolen* is regularly four-parted, with lobes about equal in size and about uniform in shape (Fig. 1e). In section *Vouapa* the lobes are five and free, or five with the adaxial pair united laterally to a greater or lesser extent, or four by the complete lateral union of the adaxial pair (Figs. 1a-d). While the number of sepals has been employed to some degree in delimiting species, it has more often been neglected for more easily discernible characters. In each of the phylogenetically lower taxa of section *Vouapa* the sepals are about equal in size, but in the more advanced forms the adaxial pair is often smaller and frequently of a different shape from the other lobes.

The single petal, which is situated on the adaxial side of the flower, is of two general types (Figs. 1a, e). In section *Stenosolen* it is an elliptic, oval, or ob-lanceolate organ, sometimes sessile or more often with a very short insignificant claw. In the section *Vouapa* the petal is provided with a definite stipe about as long as or longer than the transversely oval or orbicular blade. The term "transversely oval" refers to an oval outline in which the long axis is perpendicular to the claw. The size and form of the blade is of only moderate importance as a diagnostic character. Petalodia, that is, vestigial petals, occur sporadically in several groups, but they are so infrequent in their occurrence that they are rarely mentioned in the descriptions and are of no use taxonomically.

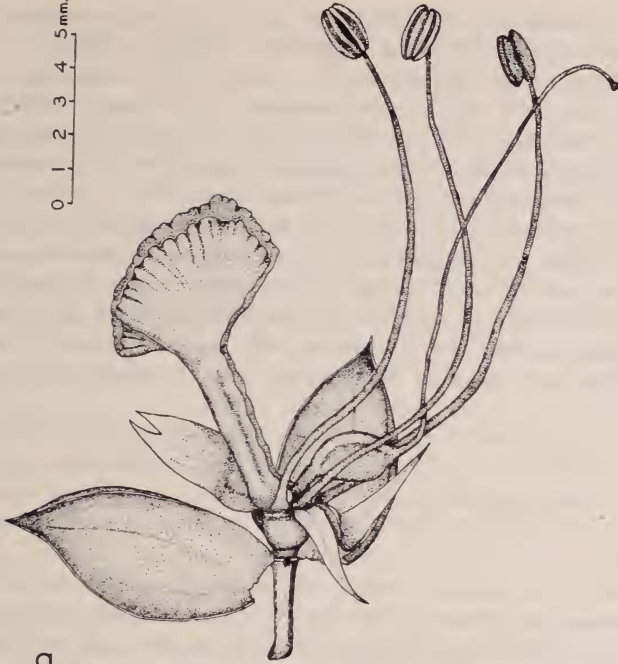
Of the three stamens, one is abaxial and the other two are lateral. Occasionally the length of the filaments and the presence or absence of pubescence on them provide the only characters of even secondary importance in delimiting taxa. They are always long and slender, bearing at their apex versatile, bilocular anthers. The pollen grains are trilobate, and Dr. Erdtman described their structure (in correspondence) as follows: "On micromorphological basis the 'sexine'... is conspicuously striate. The striae are densely spaced in the South American species; their upper surface is flat, and the extosexine (which forms the bulk of the striae) is supported by short rods ('bacula'); in some species they are almost lacking."

The single pistil consists of a short to long gynophore, an ovary, style, and stigma (Figs. 1a, e). Although the tribe Amherstieae has been characterized as possessing a gynophore inserted on the adaxial wall of the hypanthium, in *Macrobium* it may be thus inserted or free from the hypanthium. Below the point at which the gynophore becomes free from the wall (except when it is basally in-

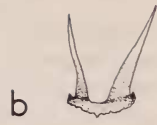
Explanation of Figure 1

FIG. 1. a. Flower of *M. multijugum*, a representative species of section *Vouapa*. b-d. Adaxial sepal pair from three species to show stages in lateral union; b. *M. microcalyx*, $\times 4$; c. *M. multijugum*, $\times 4$; and d. *M. canaliculatum*, $\times 2$; e. Flower of *M. stenosisiphon*, type species of section *Stenosolen*. f. Bracteoles of *M. stenosisiphon* showing incomplete opening on adaxial side of flower.

0 1 2 3 4 5 mm.



d



b

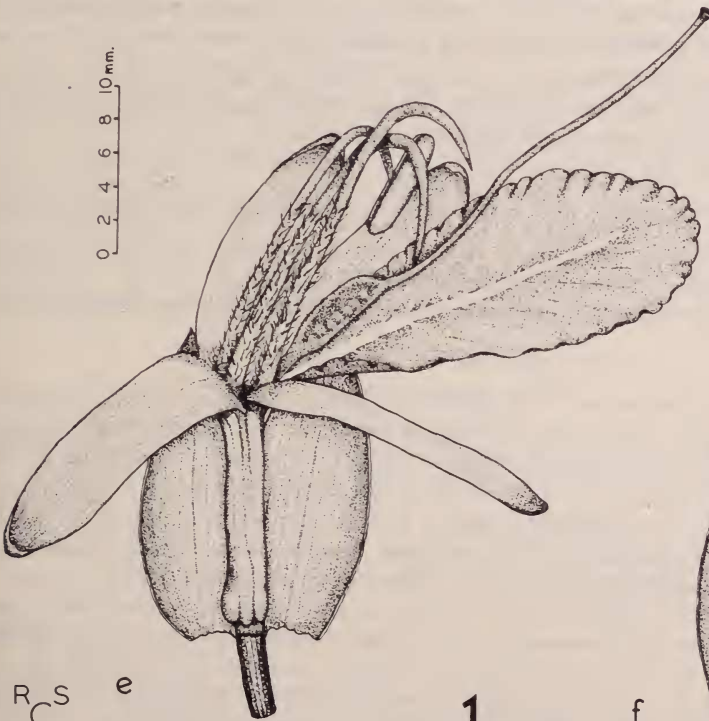


c



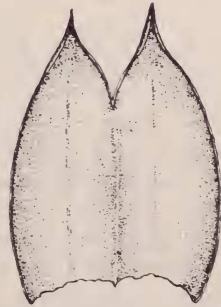
d

0 2 4 6 8 10 mm.



R_CS e

1



f

serted), its presence is indicated by a ridge to the base of the hypanthium. It appears probable that the ancestral forms had a basally attached gynophore.

The ovary provides important characters in the type and distribution of its pubescence, both of which are very stable characteristics. The ovary may be pubescent on all surfaces, marginally only, or completely glabrous. The ovules vary from one to eight, but it is usually in the more primitive groups that more than two or three appear. The other parts of the pistil contribute no usable characters.

Fruit. The legume is flattened laterally but is quite diverse in size and outline within the genus. It varies from suborbicular to oblong or cleaver-shaped and in length from about three centimeters to over fifteen centimeters. It may be indehiscent, as in *M. acaciaefolium*, *M. multijugum*, and *M. flexuosum* (fide Ducke), or dehiscent to release one to very few flat seeds which are orbicular to oblong in outline. The dimensions and shape of the legumes are of limited utility taxonomically.

Vesture. The pubescence found in the various species of the genus is always simple but sometimes considerably modified. The hairs of *M. latifolium* are distinctly clavate, and such hairs are also observed scattered amid the ribbon-like hairs of certain organs in *M. bifolium*. Uncinate hairs occur in a number of taxa, principally on the leaves.

The hairs are commonly less than a millimeter in length and in some forms visible only with a dissecting microscope, yet the character of the pubescence is used rather extensively, particularly its distribution and its presence or absence. Because differences in relative lengths are of true importance even in these minute hairs, it is necessary to define the author's use of terms in this paper which are more often applied elsewhere to hairs of considerably greater length.

1. Puberulous: hairs 0.1 mm. or less in length; this type of pubescence may be discernible with a hand-lens or naked eye (minutely puberulous) or a dissecting microscope may be necessary (microscopically puberulous).
2. Pilosulose: straight hairs about 0.3 mm. long.
3. Villosulose: similar to the preceding in length, but the hairs more or less tortuous.
4. Pilose: hairs straight and more than 0.3 mm. long.
5. Villose: hairs of about same length as preceding but more or less tortuous.

DEVELOPMENTAL TRENDS

Phylogenetic discussion on most groups of plants is often based on nearly pure speculation, with a minimum of concrete evidence. In *Macrolobium* the evidence is so fragmentary that the following is concerned only with possible trends of development which may have occurred in the evolutionary history of the genus. That is, these remarks are intended primarily to set forth the writer's conclusions regarding the possible sequence of the resultant morphological modifications, for these conclusions underlie the systematic organization presented later.

The species of the African genera related to *Macrolobium* reflect their relatively primitive nature in a number of respects, namely, by their pentamerous corolla and by their regular possession of small stamens and/or staminodia. In addition, they possess a cupular hypanthium, which form is considered to be antecedent to the cylindrical form found in the species of section *Stenosolen* of the American genus *Macrolobium*. The species of section *Vouapa* of this genus have the same type of hypanthium as is exhibited by the more primitive African species.

It appears rather certain that there has been in *Macrolobium*, in several of the lines of relationship, a reduction in the number of sepals, from five to four. The

anatomical results, cited earlier, indicate that this has been accomplished by the lateral union of the adaxial pair of sepals (Figs. 1b-d). Now, if the cylindrical hypanthium is truly advanced, then we might expect that the calyx would also show the advanced sepal number of four. This is regularly true. In the two principal lines of development here designated as sections, the calyx has developed somewhat differently. There is a tendency in the species groups of section *Vouapa* for those species considered to be more advanced in the total of their characteristics to have the adaxial pair of sepals more or less reduced and often much different from the others in shape. In section *Stenosolen*, on the other hand, the sepals are about equal in size and essentially uniform in shape.

One of the basic differences separating the two sections of *Macrolobium* is the failure of the bracteoles to open completely on the adaxial side of the flower in section *Stenosolen* (Figs. 1e, f). What selective advantage such a modification could possibly possess is difficult to imagine, but it may be considered as a specialization, indicative of a derivation from the situation in the other section in which the bracteoles open completely.

The two sections are also easily separable by the presence or absence of a claw to the single petal. It appears possible that the clawed petal of section *Vouapa* is the more advanced form, having originated by elongation of the basal portion of the blade (Fig. 1a). On this basis, then, the section *Stenosolen*, more highly evolved in respect to floral characters, possesses the more primitive petal form. There is possible, however, an alternative hypothesis, that its subsessile or sessile petal may have evolved by the progressive abbreviation of the claw (Fig. 1e). If the latter could be demonstrated, the species of this section might be looked upon as the most advanced in all their floral characters.

In regard to developmental trends in the vegetative system, there is rather clearly a progressive reduction in the number of pairs of leaflets per leaf, which trend is more or less correlated with advancement in the flower. The more primitive species of both sections have multijugate leaves, but each of the lines within the sections is culminated by unijugate species.

The diagram of relationships (Fig. 2) is a graphic representation of the foregoing conclusions; the sole intent here is to indicate specific interrelationships. That is, a line in the diagram from one species to another does not necessarily imply that the writer believes the one species has given rise to the other.

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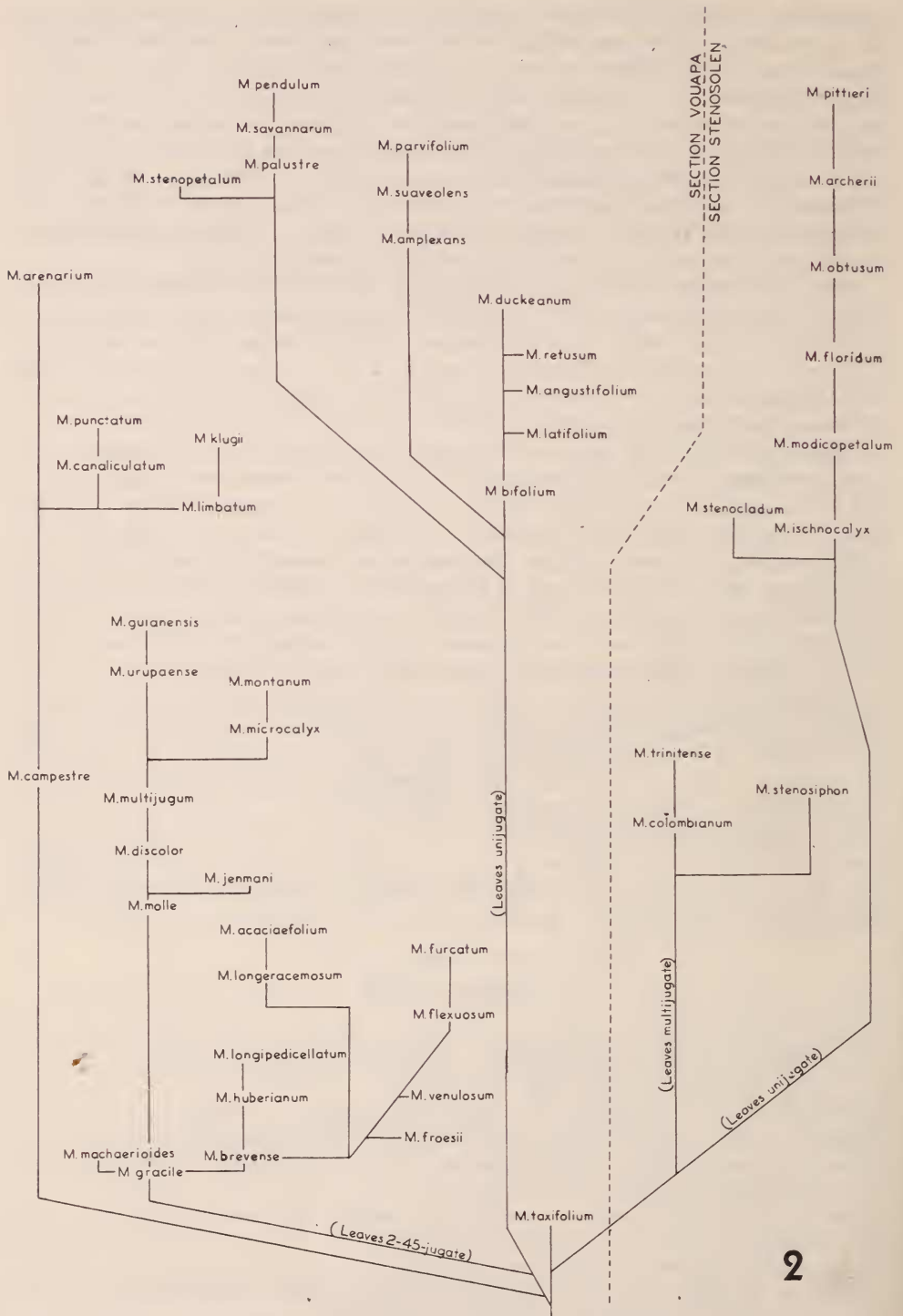


FIG. 2. Diagram of putative relationships within the genus *Macrolobium*.

SYSTEMATIC TREATMENT

Macrolobium Schreb. Gen. Pl. 1:30. 1789. (Nomen conservandum.)

Vouapa Aublet, Hist. Pl. Gui. Franç. 1:25-28. 1775.

Outea Aublet, Hist. Pl. Gui. Franç. 1:28-30. 1775.

Kruegeria Scopoli, Introd. 314. 1777.

Vuapa J. St.-Hil. Expos. Fam. 2:203. 1805.

Utea J. St.-Hil. Expos. Fam. 2:203. 1805.

Pseudovouapa Britton & Killip, Ann. N. Y. Acad. 35:166. 1936.

Small shrubs to large trees. *Stipules* persistent or more frequently caducous, sometimes foliaceous. *Leaves* petiolate, 1-45-jugate, paripinnate or pseudo-imparipinnate. *Leaflets* opposite, inequilateral or infrequently equilateral, petiolules sometimes present; very diverse in size and form, sometimes punctate on the lower surface. *Inflorescence* racemose, rarely with short racemose branchlets, sessile or pedunculate; bracts usually caducous, diverse in size and form, often minute; bracteoles at the summit of the pedicels encasing the flower before anthesis, finally opening completely, or only partially on the adaxial side of the flower. *Hypanthium* sessile or stipitate, cupular to narrowly cylindrical. *Sepals* four or five, sometimes the adaxial pair of different size and form from the others and free or united laterally to a greater or lesser extent. *Petal* one, stipitate or sessile, the blade orbicular, transversely or longitudinally oval, elliptic, or oblanceolate. *Stamens* three, the filaments filiform, the anthers versatile, dehiscing longitudinally, the pollen grains three-lobed. *Stigma* simple to capitate. *Style* long-filiform. *Ovary* 1-8-ovulate, the gynophore inserted at the base of or on the adaxial wall of the hypanthium. *Fruit* dehiscent or indehiscent, oval or orbicular to oblong, 1-few-seeded.

TYPE Species: *Macrolobium bifolium* (Aubl.) Pers. Syn. Pl. 1: 39. 1805.

Key to the Sections of *Macrolobium*

1. Hypanthium cupular (short-cylindric in *M. taxifolium*), about as long as or slightly longer than broad; bracteoles opening equally on both sides of the flower; sepals four or five, variable in shape and size; petal with a claw about as long as the blade. Sect. 1. *Vouapa*
1. Hypanthium cylindrical, many times longer than broad; bracteoles usually opening completely on the abaxial side of the flower but only partially on the adaxial side; sepals always four, about equal in size and shape; petal sessile or with a claw much shorter than the blade. Sect. 2. *Stenosolen*

Macrolobium Section 1. *Vouapa* (Aubl.) Benth. in Mart. Fl. Bras. 15(2): 218. 1870.

Bracteoles opening completely on both sides of the flower; hypanthium cupular (short-cylindric in *M. taxifolium*); sepals four or five, usually unequal in shape and/or size; petal obviously clawed; gynophore inserted at any point from the base to the apex of the adaxial wall of the hypanthium.

TYPE Species: *Macrolobium bifolium* (Aubl.) Pers. (which is also the generic type).

Key to the Species of Section 1. *Vouapa*

1. Leaves 2-45-jugate. 2.
1. Leaves unijugate (some leaves bijugate in *M. palustre* and very rarely in *M. punctatum*). 31.
2. Leaflets with petiolules 2.5-6 mm. long, ovate to lanceolate, the base equilateral; bracts 5.5-12 mm. long, lanceolate and acuminate. 21. *M. campestre*.
2. Leaflets sessile, variously shaped, the base inequilateral; bracts smaller, variously shaped. 3.
3. Leaves 2-6-jugate. 4.
3. Leaves 6-42-jugate. 12.

4. Ovary glabrous on all surfaces. 5.
4. Ovary sparsely to densely pubescent on margins or on all surfaces. 7.
5. Peduncle (10-)15-25(-55) mm. long; leaflets strongly punctate on lower surface. 16. *M. multijugum*.
5. Peduncle 1.5-9 mm. long; leaflets epunctate. 6.
6. Leaves 5-7-jugate; bracteoles glabrous; filaments 25-35 mm. long, strongly villose. 19. *M. urupaense*.
6. Leaves 2-3-jugate; bracteoles pubescent on one or both surfaces; filaments 10-20 mm. long, villosulose basally or glabrous. 18. *M. montanum*.
7. Ovary villose on all surfaces; sepals free, strongly dimorphic, the adaxial pair smaller and of a different shape from the others. 17. *M. microcalyx*.
7. Ovary more or less pubescent on the margins only; sepals variable, sometimes dimorphic, free or united. 8.
8. Leaflets distinctly punctate on lower surface. 9.
8. Leaflets epunctate. 11.
9. Leaflets oblong to oblong-obovate; peduncles 9-55 mm. long; fruit 3-7.5 cm. long, 3-5 cm. wide. 10.
9. Leaflets lanceolate; peduncles 2-3 mm. long; fruit 12.5-15.5 cm. long, 7.5-9 cm. wide. 14. *M. jenmanii*.
10. Leaflets velvety-puberulous on the upper surface, pilose beneath; inflorescence pilosulose. 13. *M. molle*.
10. Leaflets glabrous or more often puberulous in a small area at base of costa; inflorescence glabrous or minutely puberulous. 16. *M. multijugum*.
11. Leaflets oval to elliptic, in two pairs, concolorous; inflorescence axis glabrous; stipules persistent. 20. *M. guianense*.
11. Leaflets oblong, oblong-oval or oblong-obovate, in 3-7 pairs, lower surfaces strongly glaucous. 15. *M. discolor*.
12. Leaves (4-)6-10-jugate. 13.
12. Leaves 10-42-jugate. 18.
13. Peduncle 10-55 mm. long. 14.
13. Peduncle 1-6 mm. long. 15.
14. Leaflets velvety-puberulous on the upper surface, pilose beneath, entire, involute narrowly; inflorescence pilosulose. 13. *M. molle*.
14. Leaflets glabrous or with few minute hairs beneath at base of costa, entire or sinuate, plane; inflorescence glabrous or minutely puberulous. 16. *M. multijugum*.
15. Ovary glabrous; bracteoles glabrous or with a few apical hairs externally. 16.
15. Ovary pubescent throughout or only marginally; bracteoles pubescent on both surfaces or only on outer surface. 17.
16. Leaves 5-7-jugate, leaflets about twice as long as wide; filaments villose for half or more of their length, 25-35 mm. long. 19. *M. urupaense*.
16. Leaves 10-14-jugate, the leaflets about three times as long as wide; filaments glabrous, about 15 mm. long. 12. *M. furcatum*.
17. Inflorescence terminal; gynophore inserted at or near apex of dorsal wall of hypanthium; leaves never over 7-jugate, strongly glaucous beneath. 15. *M. discolor*.
17. Inflorescences axillary; gynophore inserted at base of hypanthium; leaves 10-16-jugate, not strongly glaucous beneath. 11. *M. flexuosum*.
18. Leaves 10-30-jugate (to 40-jugate in *M. gracile* var. *confertum* but this with densely pilosulose ovary marginally, much smaller bracts than in following species), leaflets plane or only very slightly convex; hypanthium cupular. 19.
18. Leaves 35-45-jugate, each leaflet strongly convex; hypanthium short-cylindric. 1. *M. taxifolium*.
19. Stipules persistent or caducous; pedicels averaging about 6 mm. long (4-8 mm.); bracteoles glabrous. 20.
19. Stipules caducous; pedicels shorter; bracteoles pubescent on both surfaces or only on outer surface (sparingly pubescent apically in *M. furcatum*). 21.
20. Stipules caducous; leaves elliptic or lanceolate, the leaflets truncate at apex, retuse to emarginate; bracts 8 mm. long, 2.5 mm. wide. 6. *M. longi-pedicellatum*.
20. Stipules persistent; leaves oblong to lance-oblong, the leaflets rotund apically, entire or subentire; bracts 3.5-5.5 mm. long, 1-1.5 mm. wide. 5. *M. huberianum*.
21. Bracteoles glabrous on inner surface, usually pubescent on outer surface; filaments glabrous; fruit about one and a half times as long as wide (three to four times in *M. longeracemosum*). 22.
21. Bracteoles pubescent on both surfaces (in *M. venulosum* only on inner surface near apex), pubescence on the two surfaces usually of different types; filaments villosulose

- in lower part (glabrous in *M. froesii*); fruit two and one half to three and one half times as long as wide. 24.
22. Peduncles 4-6 mm. long; leaves 11-14-jugate, leaflets oval-oblong, the pairs 8-12 mm. apart; plant essentially glabrous. 12. *M. furcatum*.
22. Peduncles 0-4 mm. long, densely pilosulose, bracts pubescent on outer surface; ovary pilosulose marginally; branchlets densely pilosulose to glabrous; leaves commonly 15-25-jugate, the leaflets oblong, the pairs 4-8 mm. apart, usually pubescent on costa on lower surface but sometimes glabrous. 23.
23. Costa of leaflets distinctly salient on both surfaces, venules prominent on upper surface; bracteoles and pedicels lanulose-puberulous; fruit about three to four times as long as wide. 7. *M. longeracemosum*.
23. Costa impressed on upper surface of leaflets, salient beneath, venules obscure; bracteoles and pedicels pilosulose; fruit about one and a half times as long as wide. 8. *M. acaciaefolium*.
24. Leaves 10-16-jugate, pairs of leaflets 9-20 mm. apart, the leaflets with many closely parallel veins prominent on both sides, the median leaflets of mature leaves about 4 cm. long, 1.5 cm. wide. 11. *M. flexuosum*.
24. Leaves 10-40-jugate, pairs of leaflets 2-10 mm. apart, the leaflets with obscure veins or sometimes prominulous on one or both surfaces but then not closely parallel, median leaflets of mature leaves usually less than 2.5 cm. long, 1 cm. wide. 25.
25. Inflorescences 2-6.5 cm. long. 26.
25. Inflorescences usually less than 2 cm. in length. 2. *M. gracile*.
26. Inflorescence pilosulose, the bracteoles flexuose-pilosulose and pilose on outer surface; costa of leaflets strongly salient on upper surface. 4. *M. brevense*.
26. Inflorescence puberulous, the bracteoles puberulous or short-pilosulose and puberulous on outer surface; costa of leaflets plane or impressed on upper surface (salient in *M. gracile* variety *machadoense*, but this with strongly lanceolate leaves). 27.
27. Leaflets truncate at apex. 30.
27. Leaflets rotund at apex. 28.
28. Leaflets two to three times as long as wide, not tapering toward the emarginate or retuse apex. 29.
28. Leaflets four to six times as long as wide, tapering toward the entire or slightly retuse apex. 2. *M. gracile*.
29. Upper side of leaflet base strongly angular-auriculate, the apex strongly emarginate; sepals 1.5-2.5 mm. long, acute; filaments villosulose; ovary villose marginally 3. *M. machaerioides*.
29. Upper side of leaflet base not auriculate, the apex weakly retuse; sepals 3.5 mm. long, acuminate; filaments glabrous; ovary pilosulose marginally. 9. *M. froesii*.
30. Large shrub or small tree to 5 m. tall with branchlets, rachis, petioles and carpophores puberulous; leaves oblong, the leaflets in 13-17 pairs, 6-7 mm. apart, the costa plane on upper surface. 10. *M. venulosum*.
30. Tree 20 m. tall with branchlets, lower surface of rachis, and carpophores pilosulose; leaves strongly lanceolate, the leaflets in 20-24 pairs, 3-5 mm. apart, the costa salient on upper surface. 2. *M. gracile*.
31. Leaflets with well-developed intramarginal nerves. 32.
31. Leaflets without intramarginal nerves. 33.
32. Leaflets with venules closely parallel and prominulous on both surfaces, the intramarginal nerve originating from base of costa, the apex strongly emarginate, rotund. 30. *M. retusum*.
32. Leaflets with venules obscure or if prominulous, not closely parallel, the intramarginal nerve formed by anastomosing of primary veins, the apex entire, acute to acuminate. 25. *M. unijugum*.
33. Ovary pubescent throughout or only on margins. 34.
33. Ovary glabrous. 43.
34. Ovary pubescent throughout. 35.
34. Ovary pubescent only on margins. 41.
35. Hairs of inflorescence and flower parts preponderantly clavate; bracteoles 6-8.5 mm. long, very thick-coriaceous; hypanthium densely clavate-puberulous. Plants endemic to coastal rain forest of Brazil between Bahia and Ilheos. 28. *M. latifolium*.
35. Hairs not clavate but terete or ribbon-like; bracteoles smaller and thinner though sometimes coriaceous; hypanthium glabrous or with minute hairs sparsely distributed. Mostly northeastern South America. 36.
36. Leaflets epunctate on lower surface; blade of petal orbicular or oval. 37.
36. Leaflets punctate beneath; blade of petal oval transversely. 40.

37. Inflorescence densely puberulous, the hairs usually ribbon-like; costa of leaflets sulcate on upper surface, venules prominent, petioles glabrous; lateral surfaces of ovary and fruit papillate-puberulous. 27. *M. bifolium*.
37. Inflorescence minutely puberulous, the hairs terete; costa of leaflets not sulcate, the venules subobscure, petioles minutely puberulous; lateral surfaces of ovary and fruit not papillate-puberulous. 38.
38. Petioles 18-25 mm. long; leaflets 20-30 cm. long; sepals 6-6.5 mm. long. 25. *M. unijugum*.
38. Petioles 4-13 mm. long; leaflets 8-17 cm. long; sepals 1-4 mm. long. 39.
39. Costa of leaflet minutely puberulous on upper surface and strongly salient; petioles 4-6 mm. long; sepals 5, lanceolate, acute. 33. *M. suaveolens*.
39. Costa glabrous, plane; petioles 8-13 mm. long; sepals 4, oblong or oval, obtuse. 32. *M. amplexans*.
40. Leaflets broadly rotund-auriculate on lower side of base; petioles 10-16 mm. long; sepals 4.5-5 mm. long, oblong; petal blade 5.5 mm. long, 8 mm. wide. 31. *M. ducleanum*.
40. Leaflets cuneate at base; petioles 4-5 mm. long; sepals 1.5-3.5 mm. long, lanceolate; petal blade 3-4.5 mm. long, 3.5-4.5 mm. wide. 33. *M. suaveolens*.
41. Inflorescence densely puberulous to pilosulose, the bracts about 5 mm. long, 3 mm. wide, never triangular, the bracteoles strigulose within, densely puberulous to pilosulose externally; ovary pilosulose marginally, otherwise glabrous. 29. *M. angustifolium*.
41. Inflorescence glabrous or minutely puberulous, the bracts triangular, 1-1.5 mm. long and wide, the bracteoles glabrous, or minutely puberulous externally; ovary minutely puberulous marginally, otherwise glabrous. 42.
42. Inflorescence glabrous; petal about as long as bracteoles, more or less spatulate, without a definite claw; bracteoles oblong to lanceolate, 8-13.5 mm. long; hypanthium 3-4 mm. long. 38. *M. stenopetalum*.
42. Inflorescence minutely puberulous; petal longer than bracteoles, orbicular to transversely oval, with well-developed claw; bracteoles oval, elliptic or oblong, 5-6.5 mm. long; hypanthium 1-2 mm. long. 33. *M. suaveolens*.
43. Sepals five, free, or the adaxial pair more or less united. 44.
43. Sepals four, free. 46.
44. Leaflets equilateral, oval, lanceolate or ovate, not at all arcuate, the petiolules 3-5 mm. long, terete or plane on upper surface; inflorescence glabrous or pilosulose. 22. *M. arenarium*.
44. Leaflets inequilateral, oval-elliptic to elliptic, falcate or arcuate, epetiolulate; inflorescence axis minutely puberulous. 45.
45. Leaflets epunctate beneath, acute; bracts at base of inflorescence persistent, closely imbricate, sterile; ovary and gynophore glabrous. 34. *M. parvifolium*.
45. Leaflets punctate beneath, acuminate; bracts caducous; gynophore pilosulose on adaxial surface. 33. *M. suaveolens*.
46. Hypanthium 2.5-3.5 mm. long on stipe 2-4 mm. long; bracteoles apically rounded, apiculate or cuspidate, cariose, often early caducous; leaflets on petiolules 2-10 mm. long; petioles flattened dorso-ventrally. 47.
46. Hypanthium 1-2 mm. long, sessile or with stipe 1 mm. long; bracteoles acute to acuminate, persistent; leaflets sessile, petioles terete. 48.
47. Leaflets strongly rounded on lower side of base, often punctate beneath, falcate, apex acute to acuminate; sepals 4-7.5 mm. long; petal 4-5.5 mm. wide, more or less erect; bracteoles 3.5-8 mm. long, 2-3.5 mm. wide. 24. *M. punctatum*.
47. Leaflets not rounded basally, epunctate, moderately arcuate, apex rounded-obtuse; sepals 9.5-11 mm. long; petal 7-8 mm. wide, strongly recurved; bracteoles 10.5 mm. long, 5 mm. wide. 23. *M. canaliculatum*.
48. Stipules and rachis rudiment persistent; hypanthium strongly zygomorphic; leaflets often punctate. Belem and Amazon Delta region to southern Amazonas. 37. *M. pendulum*.
48. Stipules and rachis rudiment caducous; hypanthium symmetric to asymmetric; leaflets epunctate. Eastern Peru, upper Rio Negro and southwestern Venezuela. 49.
49. Filaments glabrous; petioles 1.5-4 mm. long; leaflets 1.5-5.5 cm. long, 1-2.5 cm. wide, lower side of base rounded. 36. *M. savannarum*.
49. Filaments pubescent toward base; petioles 7-18 mm. long; leaflets larger, base cuneate. 50.
50. Leaves always unijugate, the leaflets 11.5-17 cm. long, narrowly elliptic, the petioles 7-9 mm. long; inflorescence axis microscopically puberulous, the pedicels 4-5 mm.

- long; sepals 5-5.5 mm. long; bracteoles 6.5 mm. long, 3 mm. wide, minutely puberulous externally; ovules 5. Eastern Peru. 26. *M. klugii*.
50. Leaves mostly unijugate but some bijugate, the leaflets 6.5-9.5 cm. long, subarcuate, elliptic, the petioles 13-18 mm. long; inflorescence axis glabrous, the pedicels 6-8 mm. long; sepals 7-8 mm. long; bracteoles 10-11 mm. long, 5 mm. wide, glabrous; ovules 1-2. Upper Rio Negro. 35. *M. palustre*.

Section 2. *Stenosolen* Harms, Repert. Nov. Sp. 3:51. 1906.

Bracteoles opening incompletely on the adaxial side of the flower, opening completely abaxially; hypanthium long-cylindric; sepals four, equal; petal sessile or with a very short claw; gynophore inserted at top of the adaxial wall of the hypanthium.

TYPE Species: *Macrolobium stenosphon* Harms, Repert. Nov. Sp. 3: 51. 1906.

Key to the Species of Section 2. *Stenosolen*

1. Leaves 2-30-jugate. 2.
1. Leaves unijugate. 4.
2. Leaves 20-30-jugate, the leaflets subfalcate-lanceolate, mucronate-acuminate, with sericeous marginal band on upper surface; hypanthium 18-24 mm. long; sepals 18-22 mm. long; petal 30-45 mm. long. 39. *M. stenosphon*.
2. Leaves 2-13-jugate, the leaflets oblong, lanceolate-oblong, or elliptic, obtuse or bluntly acuminate, glabrous or ciliolate on margin; hypanthium, sepals and petal much shorter. 3.
3. Leaflets elliptic, in 2-4 pairs; inflorescences cauliflorous, glabrous; ovary glabrous. Northern Trinidad. 41. *M. trinitense*.
3. Leaflets oblong or lanceolate-oblong, in 5-13 pairs; inflorescences terminal or axillary, pubescent or the pedicels glabrous; ovary pubescent throughout or only marginally. Foothills of Andes in Colombia and Venezuela. 40. *M. colombianum*.
4. Leaflet strongly asymmetrical at base, the lower side rounded to subcordate, the upper side tapering. 5.
4. Leaflet cuneate at base or nearly so. 8.
5. Sepals 10-13 mm. long; hypanthium minutely puberulous. State of Aragua, Venezuela. 6.
5. Sepals 17-22 mm. long; hypanthium glabrous. Southern Panama or Colombia. 7.
6. Petal blade 30 mm. long; leaflets oblanceolate-elliptic, bluntly acute; hypanthium 9-12 mm long; bracts 2-3 mm. long. 45. *M. floridum*.
6. Petal blade 20 mm. long; leaflets elliptic-oval or broadly oblanceolate, broadly rounded; hypanthium 6.5-9.5 mm. long; bracts 1-1.5 mm. long. 46. *M. obtusum*.
7. Petal 28 mm. long, 12 mm. wide, sessile, glabrous; hypanthium 14 mm. long on a 4.5 mm. stipe; bracteoles 17 mm. long, 6.5 mm. wide, minutely puberulous on outer surface; leaflets elliptic, bluntly acuminate. 47. *M. archeri*.
7. Petal 47 mm. long, 15 mm. wide, the claw 5 mm. long, strigulose within on costa in the lower portion of petal; hypanthium 10 mm. long on a 3 mm. stipe; bracteoles 12 mm. long, 4 mm. wide, glabrous; leaflets oblanceolate, caudate-acuminate. 48. *M. pittieri*.
8. Leaflets 4-10 cm. long, sessile, epunctate; sepals oblanceolate; ovary densely puberulous throughout. 42. *M. stenocladum*.
8. Leaflets 13.5-33 cm. long, usually petiolulate, punctate beneath, sometimes minutely so; sepals oblong; ovary puberulous marginally with lateral surfaces glabrous or minutely granular-puberulous. 9.
9. Pedicels 2.5-5 mm. long; bracteoles 9-13 mm. long; hypanthium 6-11 mm. long on a stipe 2.5-5.5 mm. long, minutely puberulous; sepals 10.5-15 mm. long, 3-5.5 mm. wide; petal unguiculate, 24-34 mm. long; ovary minutely granular-puberulous on lateral surfaces. Western Peru and Colombia. 43. *M. ischnocalyx*.
9. Pedicels 0.5-1 mm. long; bracteoles 5.5-7.5 mm. long; hypanthium 3-4 mm. long on a 1 mm. stipe, glabrous; sepals 5.5-8.5 mm. long, 1-3.5 mm. wide; petal sessile, 11.5-13.5 mm. long; ovary glabrous on lateral surfaces. Northwestern Panama and western Colombia. 44. *M. modicopetalum*.

1. *Macrolobium taxifolium* Spruce ex Benth. in Mart. Fl. Bras. 15(2): 224. 1870.

Vouapa taxifolia (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 394. 1891.

Vuapa taxifolia (Spruce ex Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Tree 5-7 m. tall, the branchlets pilosulose. *Stipules* 15 mm. long, 2.5 mm. wide, subfalcate-linear, ciliate. *Petioles* 6 mm. long, canaliculate, pilosulose. *Leaf blades* oblong-lanceolate, 36-42-jugate, the pairs of leaflets about 3 mm. apart; rachis 8.5-13 cm. long, pilosulose except on the lower surface of the narrow wings. *Leaflets* 5-20 mm. long, 1-3 mm. wide, linear, the base inequilateral, obtuse, the apex rotund, minutely apiculate, the upper surface convex, glabrous, nitid, the lower surface glabrous or the costa with very few hairs, the costa plane on the upper surface, salient beneath, the venules obscure. *Inflorescence* 6.5-8 cm. long, the axis pilosulose, the peduncle 3-4 mm. long; bracts 5.5 mm. long, 4.5 mm. wide, broadly oval, pilosulose, more strongly so externally; pedicels 2.5-3 mm. long, pilosulose; bracteoles 7 mm. long, 4 mm. wide, obovate or oval, bluntly acute, pilosulose externally and in the basal half within. *Hypanthium* 3-3.5 mm. long, glabrous, the stipe 0.5-1 mm. long, puberulous. *Sepals* four, equal, 5.5 mm. long, 1.5-2.5 mm. wide, oblong, fleshy-coriaceous, sparsely ciliate near the apex. *Petal* blade about 6 mm. long, 4 mm. wide, orbicular, decurrent on the 4 mm. long claw, glabrous. *Filaments* 21.5 mm. long, glabrous. *Stigma* simple. *Style* 20 mm. long, glabrous. *Ovary* 3.5 mm. long, 1.5 mm. wide, oblong, glabrous or with very few hairs on abaxial margin, 3-ovulate; gynophore 2.5 mm. long, pilosulose sparingly, inserted at top of the adaxial wall of the hypanthium. *Fruit* unknown.

Type Collection: R. Spruce 3566, "In Guainia ripis," supra ostium flum. Casiquiari, Venezuela, May-June 1854 (HOLOTYPE K, isotypes G, GH, NY, P, US-frag., W). Known only from the type collection.

Macrolobium taxifolium is placed at the beginning of this treatment because it appears to be the nearest living relative to the ancestral stock, which, hypothetically, gave rise to the two principal divergent lines within the genus. Actually, it lies about midway between the two sections, but in its more important characters appears to be more closely associated with the species of section *Vouapa*.

If the characters of *M. taxifolium* are compared with those separating the two sections, the following will be apparent. It has a short-cylindric hypanthium which is about twice as long as wide and is thus similar to that attained in the more primitive groups of section *Stenosolen*. The bracteoles open completely on both the adaxial and abaxial sides of the flower, thereby exhibiting a character of the first section. The sepal number by itself is a character of secondary importance, but here there are four equal sepals inserted on a short-cylindric hypanthium, in this respect resembling more closely the second section than the first. The petal possesses a long claw as in section *Vouapa* but it is not well-delimited from the blade.

This species is not at all closely related to any other known species; it may be most easily distinguished by its 35-45-jugate leaves, the leaflets of which are strongly convex on the upper surface, in addition to the diagnostic characters discussed above.

2. *Macrolobium gracile* Spruce ex Benth. in Mart. Fl. Bras. 15(2): 223. 1870. Figure 3.

Shrub or slender tree 4-20 m. tall, the branchlets pilosulose or pilose. *Stipules* 2-14 mm. long, 0.5-1 mm. wide, usually caducous, subulate-linear, linear, or linear-lanceolate, pilosulose on the outer surface, glabrous within. *Petioles* 1.5-6 mm. long, canaliculate, pilosulose. *Leaf blades* lanceolate, elliptic-oblong, or lanceolate-oblong, 10-40-jugate, the pairs of leaflets 2-8 mm. apart; rachis 4-14 cm. long, pilosulose or uncinately-puberulous on the upper surface and pilosulose or

glabrous beneath. *Leaflets* 2-28 mm. long, 1-8 mm. wide, oblong or linear, the base inequilateral, the upper side obtuse to cordate, the lower side acute or obtuse, the apex rotund or rotund-truncate, retuse to emarginate or less frequently entire, minutely mucronate or apiculate; upper surface pilosulose, or puberulous, or pubescent only at the base with the costa pilosulose or puberulous or very rarely completely glabrous, the lower surface glabrous, generally pilose or pilosulose, the apical-lateral surface of the costa more densely invested, or more or less pubescent only on the apical one-half of the blade and the costa; costa plane to impressed, or salient on the upper surface, salient beneath, the venules obscure. *Inflorescences* 1-6.5 cm. long, the axis puberulous, the peduncle (when

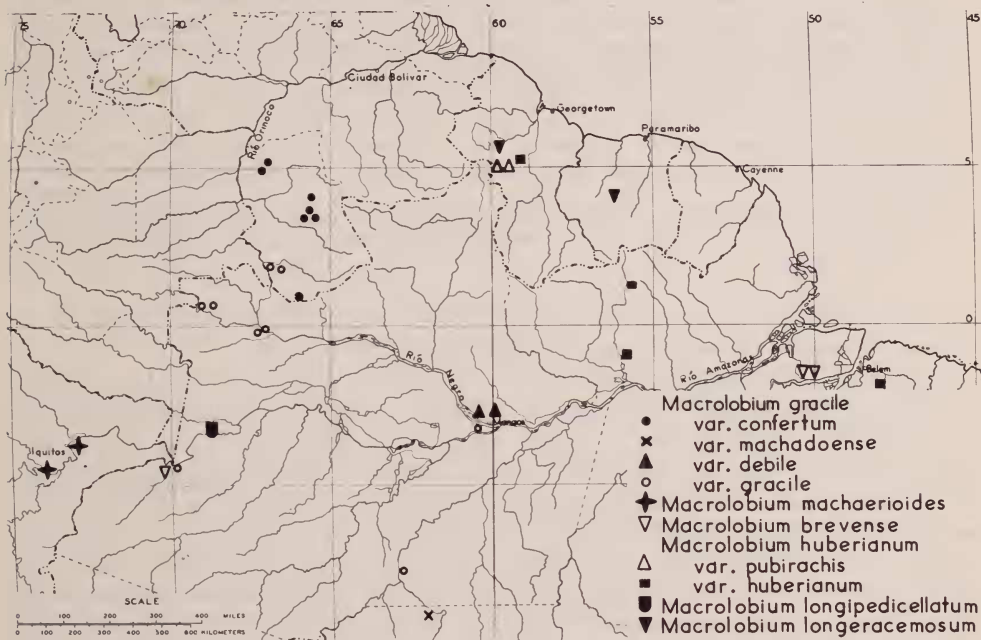


FIG. 3. Geographic distribution of several species of *Macrolobium*.

present) 1-3 mm. long; bracts 1.5-3 mm. long, 1-2.5 mm. wide, triangular, triangular-lanceolate, triangular-ovate, or oblong-ovate, glabrous within, puberulous externally; pedicels 1-3 mm. long, puberulous; bracteoles 5-7.5 mm. long, 2-4 mm. wide, oblanceolate, elliptic, lanceolate, or oblong, acute to acuminate, pilosulose or puberulous externally, pilose, pilosulose, or villosulose within, sometimes sparingly so. *Hypanthium* 1-1.5 mm. long, subsessile, sparingly puberulous, pilosulose, or infrequently glabrous. *Sepals* five, free or infrequently the adaxial pair partly united, 1-4.5 mm. long, 0.5-2 mm. wide, the adaxial pair often triangular, the others lanceolate or triangular-lanceolate, acute to acuminate, sparingly to sparsely ciliolate, infrequently glabrous. *Petal* blade 2.5-7.5 mm. long, 3-8.5 mm. wide, commonly transversely oval, sparingly villosulose on one or both surfaces in the center or only in the throat, the claw 3-6 mm. long, villosulose on both surfaces or only at the base externally, ciliolate. *Filaments* 13-27.5 mm. long, villosulose in the lower part. *Stigma* capitellate. *Style* 16.5-22 mm. long, villosulose or pilose basally. *Ovary* 1.5-2.5 mm. long, 0.5-1 mm. wide, fusiform or oblong, villose or pilose marginally, the lateral surfaces glabrous, 2-ovulate; gynophore 2-3 mm. long, villose or pilose, inserted in the hypanthium at the base,

midway or at the margin of the adaxial wall. *Fruit* (immature to mature) 5.5-11.5 cm. long, 2.5-5 cm. wide, oblong, oblong-oblancoate, or oblong-obovate, sparingly to sparsely pilose or glabrous on the margins, the carpophores 4-16 mm. long, sparingly pilose or pilosulose. *Seeds* 3.5 cm. long, 2.5 cm. wide, oval, the testa membranous, venose.

Key to the Varieties of *Macrolobium gracile*

1. Inflorescences less than 2 cm. long. 3.
1. Inflorescences 2.5-6.5 cm. long. 2.
2. Apex of leaflets rotund, entire to retuse, usually much narrower than the base, the median leaflets of mature leaves four to six times as long as wide, the costa plane to impressed on upper surface; leaves oblong to oblong-lanceolate; mature fruit 5.5-8 cm. long, 2.5-3 cm. wide. 2a. var. *confertum*.
2. Apex of leaflets truncate, strongly emarginate, not appreciably narrower than base, the median leaflets of mature leaves about two to three times as long as wide, the costa salient on upper surface; leaves lanceolate; immature fruit 11-11.5 cm. long, 3.5 cm. wide. 2b. var. *machadoense*.
3. Leaves 20-30-jugate; median leaflets of mature leaves four or more times as long as wide, glabrous, or sparsely pubescent on costa and base of blade, the apices distinctly mucronate. 2c. var. *debile*.
3. Leaves (10-)15(-20)-jugate; median leaflets of mature leaves usually about three times as long as wide, the upper surface usually pilosulose, the lower pilose, the apices minutely apiculate. 2d. var. *gracile*.

2a. *Macrolobium gracile* var. *confertum* (Gleason) Cowan, comb. nov. Figure 3.

Macrolobium confertum Gleason, Bull. Torrey Club 58: 371. 1931.

Low tree with spreading, flat-topped crown, 5-7 m. tall, the branchlets densely pilosulose. *Stipules* 6-14 mm. long, 1 mm. wide, caducous or persisting one season, acuminate. *Petioles* (2-)3(-6) mm. long. *Leaf blades* oblong to oblong-lanceolate, (14-)18-30(-40)-jugate, the pairs of leaflets (3-)4(-6) mm. apart; rachis (5-)8-10(-13.5) cm. long, pilosulose but sparingly so on the lower surface of the narrow erect wings, densely so above. *Leaflets* (4-)6-15(-28) mm. long, (1-)2-4(-6) mm. wide, linear, the base obtuse, the apex rotund to rotund-truncate, narrowing toward the entire to retuse apex, minutely apiculate, glabrous or more often sparsely to strongly puberulous on the costa on the upper surface, the hairs often uncinata, beneath glabrous, or sparingly pilosulose on the costa, the hairs often subappressed or appressed, the costa plane to impressed on the upper surface. *Inflorescence* (2.5-)3-5(-6.5) cm. long; bracts 2.5-3 mm. long, 1-2.5 mm. wide; pedicels (1-)2(-3) mm. long; bracteoles (5.5-)6-7 mm. long, 2.5-4 mm. wide, oblong to lanceolate, acute to acuminate, puberulous externally, villosulose within, at least in the upper half. *Sepals* 1.5-4.5 mm. long, 0.5-2 mm. wide, lanceolate, acute to caudate-acuminate. *Petal blade* (3.5-)4(-7.5) mm. long, (3.5-)5(-8.5) mm. wide, the claw (4-)5(-6) mm. long, the petal villosulose over the entire outer surface or only at the base, villosulose within, sometimes sparsely so. *Filaments* (16-)20(-27.5) mm. long. *Style* 15.5-22 mm. long, villosulose basally. *Ovary* oblong, villose marginally; gynophore villosulose, inserted near the apex of the adaxial wall of the hypanthium. *Fruit* 5.5-8 cm. long, 2.5-3 cm. wide, oblong to oblong-obovate or oblong-oblancoate, glabrous or with few scattered hairs on the margins, the carpophores 4-6 mm. long, pilosulose. *Seeds* about 1.5 cm. long, 1 cm. wide, oval, the testa membranous, venose.

Type Collection: G. H. Tate 375, "slopes of Mt. Duida, 750'," Amazonas, Venezuela, Nov. 1928 (HOLOTYPE NY).

Additional Specimens: VENEZUELA: Caño Asisa near Serranía Paru, Feb. 1951, Cowan & Wurdack 31523 (K, NY, US, VEN), 31526 (F, G, K, MO, NY, US, VEN); western foothills Serra Imeri, near Salto de Huá, Nov.-Dec. 1930, Holt & Blake 482 (A, NY, US,

VEN); banks of Riô Cunucunuma above Playa Alta, Nov. 1950, *Maguire, Cowan & Wurdack* 29496 (F, NY), 29505 (NY, US, VEN); Culebra, Riô Cunucunuma, Dec. 1950, *Maguire, Cowan & Wurdack* 30357 (K, NY, US), 30362 (B, BM, F, G, GH, IAN, K, LE, MO, NY, P, RB, S, U, UC, US, VEN); Riô Cuão, Nov. 1948, *Maguire & Politi* 27383 (FHO, NY, TH, WTU), 27447 (F, G, GH, IAN, K, MO, NY, P, RB, U, US, VEN); Riô Cuão, Jan. 1949, *Maguire & Politi* 28526 (A, BPI, MICH, NY); forest along Caño Negro, southeastern base of Cerro Duida, alt. 225 m., Aug. 1944, *Steyermark* 57940 (F, MO, VEN).

2b. *Macrolobium gracile* var. *machadoense* Cowan, var. nov. Figure 3.

Arbor 20 m. alta, 6 cm. diametro, ramulis dense pilosulis. Stipulae 4.5-5.5 mm. longae, 0.5 mm. latae. Petiolus 2-3 mm. longus, canaliculatus, pilosulus. Foliolorum lamina lanceolata, 20-25-jugata; rachibus 5.5-9 cm. longis, supra uncinato-puberulis, infra sparse pilosulis ad glabris. Foliola 2-15 mm. longa, 1-5 mm. lata, oblonga, ad basim inaequilateralia, ad apicem truncata, emarginata, minute apiculata, supra in costa puberula, infra plus minusve pilosula, costa ambobus lateribus salienti, venulis obscuris. Inflorescentiae 4.5-5 cm. longae, axe puberulo, flos ignotus. Fructus immaturus 11-11.5 cm. longus, oblongus, apicem versus latior, carpophoro 5 mm. longo, pilosulo.

Type Collection: *B. A. Krukoff* 1350, "upper Machado River, near Tabajara," Matto Grosso, Brazil, Nov.-Dec. 1931 (HOLOTYPE NY, isotypes A, F, G, MO, P, U, UC). Known only from the type collection.

2c. *Macrolobium gracile* var. *debile* (Ducke) Cowan, comb. nov. Figure 3.

Macrolobium debile Ducke, Bull. Mus. Hist. Nat. Paris II. 4: 729. 1932.

Shrub or small tree with pilosulose branchlets. Petioles 2-3 mm. long. Leaf blades elliptic-oblong, (16-)20-30-jugate, the pairs of leaflets 2-5 mm. apart; rachis 5-14 cm. long, the wings ciliate, the axis pilosulose sparingly. Leaflets 5-20 mm. long, 1-5 mm. wide, linear, the upper side of the base subcordate, the lower side obtuse, the apex rotund, entire, mucronate, the upper surface glabrous or very sparsely puberulous on the blade, the costa sparsely puberulous at least at the base, the lower surface glabrous to pilosulose on the costa and on the apical half of the blade. Inflorescences 1-1.5 cm. long; bracts 2.5 mm. long, 1 mm. wide, triangular-lanceolate; bracteoles elliptic, 5-6 mm. long, 2.5-3 mm. wide, the outer surface puberulous, pilose within. Sepals 1.5-3 mm. long, 0.5-1.5 mm. wide. Petal blade 3.5 mm. long, about 5 mm. wide, the claw 4.5-5 mm. long. Filaments 17-19.5 mm. long. Style 18-19.5 mm. long, villosulose basally. Ovary oblong, villose marginally, the gynophore 2 mm. long, villosulose, inserted about midway on the adaxial wall of the hypanthium. Fruit unknown.

LECTOTYPE: *A. Ducke* 20318 (flowering portion), "ad Cachoeira do Mindu, Manãos," Amazonas, Brazil, Oct. 1927 (deposited RB, isolectotypes F-frag., G, P, U, US). The fruiting portion of this collection, collected in November of the same year and in the same locality, appears to be somewhat intermediate between var. *debile* and the typical variety, which it most closely resembles. It does not have the entire, mucronate leaflet apices of var. *debile* and the distribution of the pubescence is much nearer that of the typical form. A lectotype has been chosen in this case because under the International Code of Botanical Nomenclature it is not permissible that a type be composed of more than a single collection.

Additional Specimens: BRAZIL: Amazonas: Cachoeira do Mindu, Manãos, Aug. 1935, *Ducke* 14 (A, F, IAN, MO, NY, US); ad Cachoeira do Mindu, Manãos, Nov. 1927, *Ducke* 20318 (fruiting) (G, P, RB, U).

2d. *Macrolobium gracile* var. *gracile*. Figure 3.

Vouapa gracilis (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 393. 1891.

Vuapa gracilis (Spruce ex Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Macrolobium tenue Ducke, Bol. Téc. Inst. Agron. Norte [Belém] 2: 13. 1944.

Slender tree 4-18 m. tall, the branchlets pilose. *Stipules* (3-)5-6 mm. long, 0.5 mm. wide, subulate, ciliolate. *Petioles* 1.5-3 mm. long. *Leaf blades* oblong or oblong-lanceolate, (10-)15(-20)-jugate, the pairs (2-)5(-8) mm. apart; rachis (4-)8(-11.5) cm. long, pilosulose. *Leaflets* (4-)10-11(-22) mm. long, (2-)3(-8) mm. wide, oblong, the upper side of the base subcordate to cordate, the lower side acute, the apex rotund or rotund-truncate, retuse to emarginate, usually minutely apiculate; upper surface usually generally pilosulose, or pubescent only at the base and on the costa, or rarely completely glabrous, beneath generally pilose with the apical-lateral surface of the costa more densely pubescent, sometimes pubescent only on the upper half of the blade and the costa. *Inflorescences* 1-2 cm. long; bracts 1.5-2.5 mm. long, 1 mm. wide, triangular-lanceolate or triangular; pedicels 1-3 mm. long; bracteoles oblanceolate, elliptic, or oblong, (5-)6.5-7.5 mm. long, (2-)2.5-3 mm. wide, acute to acuminate, pilosulose on the outer surface, pilose within, sometimes sparingly so. *Sepals* somewhat dimorphic, the adaxial pair triangular to lanceolate, 1.5-2 mm. long, 0.5-0.8 mm. wide, the others 2-3.5 mm. long, 1 mm. wide, lanceolate. *Petal blade* 2.5-4 mm. long, 3-5 mm. wide, transversely oval to orbicular. *Filaments* 15-20 mm. long, villosulose basally. *Style* 16.5-18 mm. long, villosulose basally. *Ovary* fusiform, villose marginally, the gynophore 2-3 mm. long, villose, inserted at the base of the hypanthium. *Fruit* (immature) 5.5-8 cm. long, 3-5 cm. wide, oblong-obovate, sparingly pilose marginally, the carpophores (8-)11-16 mm. long, sparingly pilose.

LECTOTYPE: *R. Spruce* 2659 (flowering portion), near "Panure," Rio Uaupés, Brazil, Oct. 1852 (deposited K, isolectotypes G, GH, NY, P, US, W). Since a type was not designated by the original author, one of the two collections cited by him has been chosen as the lectotype collection. Even the lectotype sheet bears material of two collections and the flowering portion alone is designated as the lectotype. The fruiting material is considered to be the same as the flowering and was collected in January 1853 in the same locality.

Additional Specimens: BRAZIL: Amazonas: upper Rio Negro, Camanaos, Sept. 1935, *Ducke* 33 (A, F, MO, NY, US); circa Cachoeira do Mindu, Manaos, Dec. 1941, *Ducke* 855 (F, IAN, MO, NY, US); Esperança, ad ostium flum. Javary, March 1942, *Ducke* 1025 (type collection of *M. tenue* Ducke) (IAN, MO, NY, RB, US); São Paulo de Olivença, April 1944, *Ducke* 2093 (IAN); super Rio Negro, Camanaos, Nov. 1932, *Ducke* (*H.J.B.R. No.*) 23297 (RB, U, US); on plateau between Rio Livramento and Rio Ipixana, Municip. Humaytá, Nov. 1934, *Krukoff* 7197 (A, F, MO, NY, U, US); ad flum. Casiquiari, Vasiva et Pacimoni, 1853-54, *Spruce* 3410 (F, GH, MO, NY, P, US, W). PERU: *Dombey s.n.* (P). VENEZUELA: San Carlos de Río Negro, Amazonas, March 1942, *Williams* 14630 (F, US, VEN).

Vernacular Name: "cipoal" (Brazil).

Of the specimens cited, *Ducke* 1025 should receive some special attention, since it is the type collection number of *M. tenue* Ducke. It has been included in the typical variety in spite of some differences between it and the remainder of the material. However, these differences are so minute and apparently insignificant that there appears to be no point in recognizing this variant as a distinct taxon of any category. The rachis of the leaves is puberulous on the upper surface instead of pilosulose, the bracts oblong-ovate instead of more or less triangular, and the pubescence of the bracteoles and of the ovary margins is somewhat shorter. Considering the rather variable nature of these characters in this species, it is impossible to maintain *M. tenue* even as a variety.

Macrobium gracile is a rather polymorphic species, but the diversity in its characters is not insoluble. It differs from *M. brevense*, its nearest relative, by the pilosulose inflorescences, flexuose-pilosulose and pilose outer surfaces of the bracteoles of the latter. The costa of *M. brevense* is strongly salient on the upper surface, which is not true of *M. gracile* except in its var. *machadoense* and

the latter has a strongly lanceolate leaf outline. Both vars. *machadoense* and *confertum* have inflorescences which are longer than those of the other two varieties and similar in length to those of *M. brevense*. There are a number of other more distant relatives of the species under discussion, which appear to have diverged from the main multijugate line of relationship and which are related to *M. gracile* through *M. brevense*.

There are four moderately well-marked varieties comprising the species. Var. *debile* and the typical variety are at once distinguishable from the others by their very short, insignificant, few-flowered inflorescences. Var. *debile* is separable from the other one by the leaflet apices and the proportions and numbers of the leaflets. The characters separating the other two varieties from each other are of the same nature. The leaflets of var. *confertum* are narrower in proportion to their length than in the other variety; the leaflet costa is plane to impressed on the upper surface, as opposed to strongly salient; the leaflet apices are rotund, entire to retuse and are distinctly narrower than their bases, in contrast to the truncate, emarginate apices of the oblong leaflets of its relative; and the leaves are oblong-lanceolate, as opposed to the lanceolate ones of var. *machadoense*. Also, the fruit of the latter is much longer than that of its relative.

3. *Macrobium machaerioides* Killip & Macbr. Field Mus. Publ. Bot. 13(3): 139. 1943. Figure 3.

Small tree 2-12 m. tall, the branchlets sparingly pilosulose, sometimes also densely uncinatopuberulous. *Stipules* 5.5 mm. long, 0.5 mm. wide, subulate-linear, ciliolate. *Petioles* 2.5-3.5 mm. long, canaliculate, pilosulose. *Leaf blades* lanceolate-oblong, 13-21-jugate, the pairs of leaflets 3.5-8 mm. apart; rachis 6.5-14.5 cm. long, above with numerous uncinat hairs on the wing margins and on the axis, below more or less pilosulose. *Leaflets* 5-25 mm. long, 2-9 mm. wide, oblong, the base inequilateral, the upper side strongly angular-auriculate, the apex strongly emarginate, the upper surface uncinatopuberulous on the costa, otherwise glabrous, beneath strongly pruinose and glabrous or pilose on and along the costa, the latter plane to impressed above, salient beneath, the venules obscure. *Inflorescences* 1.5-3 cm. long, the axis minutely puberulous, the peduncles 1-2 mm. long; bracts 1.5-2 mm. long, 1 mm. wide, triangular, acute, ciliolate, glabrous or sparsely puberulous within at the base, puberulous externally; pedicels 1-2 mm. long, puberulous; bracteoles 4-5 mm. long, 2-2.5 mm. wide, oblong, externally short-pilosulose and puberulous, within villose. *Hypanthium* 1 mm. long, sessile, glabrous. *Sepals* five, 1.5-2.5 mm. long, 1-1.5 mm. wide, the adaxial pair triangular to triangular-lanceolate, sometimes partly united, the others oblong to lanceolate, acute or obtuse, glabrous. *Petal* blade 3-4 mm. long, 4.5-5 mm. wide, oval transversely, the claw 4 mm. long, more or less auriculate basally, villosulose on the claw externally and sometimes upon the back of the blade, villosulose within on the claw and up to the center of the blade, ciliolate at the base of the claw. *Filaments* 13-16 mm. long, villose throughout most of length. *Stigma* capitellate. *Style* 15 mm. long, villosulose basally. *Ovary* 1.5 mm. long, 1 mm. wide, oval, villose marginally, the lateral surfaces glabrous, 2-ovulate, the gynophore 2-2.5 mm. long, villose, inserted at the base of the hypanthium. *Fruit* unknown.

Type Collection: G. Klug 547, "Mishuyacu, near Iquitos," 100 m., Dept. Loreto, Peru, Oct.-Nov. 1929 (HOLOTYPE US, isotypes F-frag., NY).

Additional Specimens: Marañon River from Iquitos to the mouth of the Río Santiago at Pongo de Manseriche, ca. 77° 30' West, Peru, 1924, Tessmann 4157 (G, NY).

There can be little doubt of the relationship of this species to the *M. gracile* complex. As was mentioned above, there are a number of species which are re-

lated to the latter species with *M. brevense* as an intermediate relative. *M. machaeroides*, however, appears to be much more intimately related to *M. gracile* and probably had its origin independently of the other more remotely related species. It is most easily recognized by the angular-auriculate upper side of the leaflet base and by the strongly emarginate leaflet apices.

4. *Macrobium brevense* Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 50. 1925. Figure 3.

Large tree 20-30 m. tall, the branchlets pilose and puberulous. *Stipules* 4.5 mm. long, caducous, subulate, acuminate, ciliolate. *Petioles* 2-4 mm. long, pilose or pilosulose. *Leaf blades* elliptic-oblong to oblong-lanceolate, 18-27-jugate, the pairs of leaflets 3-6 mm. apart; rachis 5.5-11.5 cm. long, the wings ciliolate, sparsely pilosulose on the upper surface, glabrous beneath, the axis uncinately-puberulous on the upper surface, sparingly pilosulose or glabrous beneath. *Leaflets* (1.5-)5-20 mm. long, 1-7 mm. wide, the upper ones minute, oblong, the base inequilateral, the upper side obtuse to cordate, the lower side subobtuse, the apex rotund, emarginate, minutely apiculate; upper surface glabrous except for arcuate or uncinately hairs on the costa, beneath glabrous or the costa with very few hairs; costa strongly salient, the venules obscure on the upper surface, subprominulous beneath. *Inflorescences* 2-5.5 cm. long, the axis densely short-pilosulose, the peduncle 2-3 mm. long; bracts 2 mm. long, 1 mm. wide, caducous, triangular, acute, glabrous within, pilosulose externally; pedicels 1.5-3 mm. long; bracteoles 5-5.5 mm. long, 2.5-3.5 mm. wide, oblong or oblong-obovate, subappressed flexuose-pilosulose and pilose on the outer surface, villose within. *Hypanthium* 1.5 mm. long, sessile, glabrous or sometimes with few hairs. *Sepals* five, 1.5-3 mm. long, 1-1.5 mm. wide, triangular-lanceolate, ciliate apically. *Petal* blade 4-5 mm. long, 3-4.5 mm. wide, orbicular, the claw 4.5-7.5 mm. long, glabrous within, villosulose externally. *Filaments* about 12 mm. long, villosulose in the lower part. *Stigma* simple or subcapitellate. *Style* about 15 mm. long, pilosulose basally. *Ovary* 2-2.5 mm. long, 1-1.5 mm. wide, oblong to oblong-oblongate, 3-4-ovulate, marginally pilose, the lateral surfaces glabrous, the gynophore 2.5 mm. long, pilose, inserted at the base of the hypanthium. *Fruit* (submature) 13.5 cm. long, 4-4.5 cm. wide, oblong, glabrous, the carpophores about 10 mm. long, glabrous.

LECTOTYPE: *A. Ducke* (*H.J.B.R. No.*) 16946 (flowering portion), "Breves, aestuario amazonico, civ. Pará, silva primaria circa campinam arenosam," July 1923 (deposited U, isolectotype US). The fruiting portion of this collection was collected in the same locality but on a much earlier date, December 1922. Both the flowering and fruiting material is considered to be representative of this species.

The selection of a lectotype was necessary here because Ducke, in his original description, cited only a single collection, which under most circumstances would be considered as the holotype. However, it really included two collections, and the International Rules provide that in such a situation a lectotype must be chosen.

Additional Specimens: BRAZIL: Esperança ad ostium flum. Javary, Amazonas, Jan. 1942, *Ducke* 899 (F, IAN, MO, NY, US); Breves, civ. Pará, Aug. 1926, *Ducke* (*H.J.B.R. No.*) 16946-A (F-frag., G, NY, P, RB, U, US). The latter collection has previously borne the number "16946" which is the number of the lectotype collection. The number has been emended to read as shown above to avoid future confusion.

The geographic distribution of this species is rather surprising but entirely understandable in a region so poorly known floristically. Its type locality is Breves (from which locality the specific epithet is drawn) in the mouth of the Amazon River and is known elsewhere only from Esperança, Amazonas in the

upper part of the Amazon Basin. It may be safely assumed that the range of the species is the length of the basin and simply has not been collected at stations intermediate between the two geographic extremes.

Macrolobium brevense appears to be a phylogenetic node from which at least two divergent lines have originated. It apparently occupies an intermediate position between these two lines and *M. gracile*. It is most nearly allied to variety *machadoense* of the latter species, and of the species in the two related lines of relationship, it is undoubtedly most nearly related to *M. huberianum*. From *M. gracile* var. *machadoense*, *M. brevense* may be most readily separated by the shape of the leaf blades and the pubescence of the inflorescence. It is amply distinct from *M. huberianum* by the glabrous bracteoles, longer pedicels, and persistent stipules of the latter species.

5. *Macrolobium huberianum* Ducke, Arch. Jard. Bot. Rio de Janeiro 1: 26. 1915.

Figure 3.

Tall shrub or small tree 4-6 m. tall, 4-10 cm. in diameter, the branchlets puberulous and pilosulose. *Stipules* 3.5-10 mm. long, 0.5-1.5 mm. wide, persistent, subulate, linear, elliptic, or lanceolate, acute or acuminate, glabrous within, puberulous externally, ciliolate. *Petioles* 2-4 mm. long, puberulous or pilosulose. *Leaf blades* oblong or lanceolate-oblong, 10-23-jugate, the pairs of leaflets 3-7 mm. apart; rachis 4.5-9.5 cm. long, puberulous above, sometimes uncinately so, the wings glabrous beneath but the axis puberulous or pilosulose. *Leaflets* 7-21 mm. long, 2.5-7 mm. wide, oblong, the base inequilateral, the upper side subcordate to cordate, the lower side acute to obtuse, the apex rotund, entire or very slightly retuse, minutely apiculate; upper surface glabrous or more or less puberulous on the costa, the hairs often uncinately, beneath appressed-pilosulose on the costa, rarely also on the blade; costa slightly impressed or plane on the upper surface, salient beneath, the venules obscure to subprominulous. *Inflorescences* 3-11 cm. long, the axis glabrous or pilosulose, the peduncles 2-6 mm. long; bracts 3.5-5.5 mm. long, 1-1.5 mm. wide, lanceolate, acuminate, glabrous except for the sparsely ciliolate margins; pedicels 3.5-8 mm. long, glabrous or puberulous; bracteoles 6-10 mm. long, 3-5.5 mm. wide, elliptic, glabrous. *Hypanthium* 2-2.5 mm. long, glabrous or sparingly pilosulose basally, sessile or with a stipe 0.5 mm. long. *Sepals* five, 2-6 mm. long, 1-2.5 mm. wide, glabrous or apically ciliate, oblong, oblong-elliptic, lanceolate or linear-lanceolate. *Petal* blade 4.5-6.5 mm. long, 4.5-8 mm. wide, orbicular to transversely oval, the claw 5-7 mm. long, auriculate basally, villosulose externally at the base, ciliolate on the claw, villosulose within on the claw and on the costa of the blade. *Filaments* 20-30 mm. long, the lower part villosulose. *Stigma* capitellate. *Style* 18-23.5 mm. long, sparsely pilosulose at the base. *Ovary* 2.5-3.5 mm. long, 1-1.5 mm. wide, linear to oblanceolate, glabrous or with a few hairs on the abaxial suture or pilosulose marginally, 3-5-ovulate, gynophore 2.5-5.5 mm. long, glabrous to pilosulose, inserted at the apex of the adaxial wall of the hypanthium. *Fruit* (immature) 6-7 cm. long, 2-3.5 cm. wide, oblong to falcate, glabrous, the carpophores 8-10 mm. long, glabrous to sparsely pilosulose, the seeds 1-2 per fruit.

Key to the Varieties of *Macrolobium huberianum*

1. Stipules 7.5-10 mm. long; leaves lanceolate-oblong; inflorescence axis pilosulose, pedicels short-pilosulose or puberulous; sepals 5-6 mm. long, 1.5-2.5 mm. wide; ovary marginally pilosulose, lateral surfaces glabrous. 5a. var. *pubirachis*.
1. Stipules 3.5-4 mm. long; leaves oblong; inflorescence axis and pedicels glabrous; sepals 2-4.5 mm. long, 1-1.5 mm. wide; ovary subglabrous with few hairs on the abaxial margin. 5b. var. *huberianum*.

5a. *Macrolobium huberianum* var. *pubirachis* Amshoff, Bull. Torrey Club 75: 389. 1948. Figure 3.

Tree 4-6 m. tall, 4-10 cm. in diameter. *Stipules* 7.5-10 mm. long, 1-1.5 mm. wide, linear to elliptic or lanceolate, arcuate to falcate, acuminate. *Petioles* 2-3 mm. long, pilosulose. *Leaf blade* lanceolate-oblong, 10-19-jugate. *Inflorescence* 4-11 cm. long, the axis pilosulose; pedicels 4.5-8 mm. long, puberulous; bracteoles 8.5-10 mm. long, 4-5.5 mm. wide. *Sepals* 5-6 mm. long, 1.5-2.5 mm. wide. *Petal claw* 6-7 mm. long. *Ovary* pilosulose on the margins, the lateral surfaces glabrous. Only immature fruit known.

Type Collection: B. Maguire & D. B. Fanshawe 23507, "Kaieteur Plateau, Potaro River below Tukeit," British Guiana, May 1944 (HOLOTYPE NY, isotypes F, MO, U, US).

Additional Specimens: BRITISH GUIANA: Potaro R., below Tukeit, June 1944, *Fanshawe* 1945 (F.D. 4681) and May 1944, *Fanshawe* 1954 (F.D. 4690) (BGF); Potaro R., Tumatumari, July 1921, *Gleason* 335 (GH, NY, US); Kaieteur Plateau, Potaro R., below Tukeit, May 1944, *Maguire & Fanshawe* 23491 (F, NY, U, US).

Vernacular Name: "sarabebe."

Gleason 335 is not entirely satisfactorily placed, for in some respects it is intermediate between the two varieties. In most of its characters, however, it agrees most completely with var. *pubirachis*; for this reason and because it was collected within its range, it has been assigned to this variety.

5b. *Macrolobium huberianum* var. *huberianum*. Figure 3.

Tree or tall shrub. *Stipules* 3.5-4 mm. long, 0.5-1 mm. wide, subulate, acute. *Leaf blades* oblong, 12-23-jugate, the pairs 3-5 mm. apart; rachis puberulous but sparingly so beneath. *Leaflets* 10-20 mm. long, 3-6 mm. wide, the upper side of the base subcordate, the lower side acute. *Inflorescences* 3-8 cm. long, the axis glabrous; pedicels 3.5-6 mm. long, glabrous; bracteoles 6-8 mm. long, 3-4 mm. wide. *Sepals* 2-4.5 mm. long, 1-1.5 mm. wide, lanceolate to linear-lanceolate, glabrous. *Ovary* with few hairs on the abaxial margin.

LECTOTYPE: A. Ducke (H.A.M.P. No.) 11874, "pousseau de la region des campos de l'Ariramba, Rio Trombetas," Pará, Brazil, June 1912 (on deposit at Museo Goeldi, isolectotypes F-frag., G, US). The material of this genus in the Museo Goeldi, Belém, Brazil, has not been available for study.

Additional Specimens: BRAZIL: Pará: Cultivated in grounds of Belém Museum, introduced from Rio Ariramba (trib. Rio Trombetas), April 1940, *Ducke* 589 (F, IAN, MO, NY, US); same locality data, April 1946, *Ducke* 1935 (F, GH, IAN, NY, US); same locality data, April 1923, *Ducke* (H.J.B.R. No.) 10921 (F-frag., G, NY, RB, U, US); Rio Ariramba region, near Rio Jaramacaru, Dec. 1911, *Ducke* 11354 (F-frag., G); cultivated in Belém Museum grounds, introduced from Rio Ariramba, May 1918, *Ducke* 17023 (P); Rio Capim, March 1949, *Froes & Pires* 24167 (IAN, NY).

BRITISH GUIANA: Potaro River, Feb. 1879, *im Thum*, s.n. (K).

This species exhibits characters which closely relate it to *M. longipedicellatum*. The characters of *M. huberianum* which serve to distinguish it are: (1) its stipules are persistent; (2) its leaf blades are oblong to lanceolate-oblong; (3) its leaflets are rotund and entire or subentire at the apex; and (4) it has much smaller bracts.

It also shows considerable relationship to *M. brevense* but it is amply separated from this species by its persistent stipules, glabrous bracteoles, and longer pedicels.

The two varieties composing the species are quite distinct and readily recognizable. Var. *pubirachis*, as the specific epithet implies, has a pubescent inflorescence axis but it also has stipules which are at least twice as long as in the typical variety and its ovary is marginally pilosulose.

6. *Macrolobium longipedicellatum* Ducke, Arch. Inst. Biol. Veg. Rio de Janeiro 2: 40. 1935. Figure 3.

Tree, the branchlets pilosulose. *Petioles* 3-4 mm. long, canaliculate, sparsely pilosulose. *Leaf blades* elliptic or lanceolate, 11-15-jugate, the pairs of leaflets 4-6 mm. apart; rachis 4.5-7.5 cm. long, the wings ciliate, sparsely puberulous above toward the base, glabrous beneath, the axis pilosulose or glabrous above. *Leaflets* 5-18 mm. long, 3-6.5 mm. wide, oblong, the base inequilateral, the upper side subcordate, the lower side obtuse, the apex truncate, retuse or emarginate, apiculate, glabrous or subglabrous on the upper surface, pilose on the costa beneath, the costa impressed above, salient beneath, the venules obscure. *Inflorescences* 3.5-6 cm. long, the axis glabrous, the peduncles 1.5-3 mm. long; bracts 8 mm. long, 2.5 mm. wide, persistent almost to anthesis, lanceolate, acuminate, ciliolate apically but otherwise glabrous; pedicels 6-7 mm. long, glabrous; bracteoles 8.5 mm. long, 4.5 mm. wide, glabrous, broadly elliptic. *Hypanthium* about 2 mm. long, glabrous. *Sepals* five, the adaxial pair partly united, 5-5.5 mm. long, 2-2.5 mm. wide, oblong or oblong-elliptic, apically ciliolate. *Petal* blade 6 mm. long, 5 mm. wide, suborbicular, the claw 6 mm. long, strongly alate, pilosulose and ciliolate externally at the base of the claw, villosulose within on the claw and into the throat of the blade. *Filaments* 23 mm. long, villosulose in the lower part. *Stigma* capitellate. *Style* at least 21 mm. long, glabrous. *Ovary* 2.5 mm. long, 1 mm. wide, linear-oblong, glabrous or with very few hairs on the abaxial suture near the base, 3-ovulate, the gynophore 4.5 mm. long, villosulose, inserted at margin of the hypanthium. *Fruit* unknown.

Type Collection: A. Ducke (H.J.B.R. No.) 24067, "São Paulo de Olivenca, Rio Solimoes," Brazil, Feb. 1932 (HOLOTYPE RB, isotypes F-frag., NY, P, U, US). Known only from the type collection.

The close relationship of this species with *M. huberianum*, particularly var. *huberianum*, is obvious. *M. longipedicellatum* differs from its closest ally in having caducous stipules, elliptic or lanceolate leaf blades, differently shaped leaflet apices and very much larger bracts.

7. *Macrolobium longeracemosum* Amshoff, Bull. Torrey Club 75: 389. 1948. Figure 3.

Tree to 8 m. tall, 1.5 dm. diameter, the branchlets pilosulose and puberulous. *Petioles* 3-6 mm. long, sulcate or canaliculate, short-pilosulose. *Leaf blades* oblong, 12-19-jugate, the pairs of leaflets 4-8 mm. apart; rachis 5-12 cm. long, more or less pilosulose. *Leaflets* 8-30 mm. long, 3-7 mm. wide, oblong, the base inequilateral, obtuse, the apex rotund, retuse to emarginate; upper surface darkly lustrous and glabrous except uncinately-puberulous basally on the costa, beneath strongly glaucous, sparingly pilose basally on the costa, especially on the apical-lateral surface; costa distinctly salient, the venules subprominulous above, obscure beneath. *Inflorescences* 3-12 cm. long, the axis pilosulose, the peduncle 2-4 mm. long; pedicels 1.5-3 mm. long, lanulose-puberulous; bracteoles 5.5 mm. long, 4 mm. wide, obovate, lanulose-puberulous externally, glabrous within. *Hypanthium* 2 mm. long on a stipe about 0.5 mm. long, sparsely pilosulose. *Sepals* five, the adaxial pair partly united, 3-4 mm. long, 1-1.5 mm. wide, ciliolate apically. *Petal* blade 4 mm. long, 4.5 mm. wide, obovate, glabrous, the claw 5.5 mm. long, strongly auriculate, puberulous sparingly on the auricles. *Filaments* about 18 mm. long, glabrous. *Stigma* capitellate. *Style* about 20 mm. long, sparsely pilosulose basally. *Ovary* 3 mm. long, 1.5 mm. wide, oblong or oblong-oblancoate, marginally pilosulose, the lateral surfaces glabrous, 2-ovulate, the gynophore 2.5 mm. long, sparsely pilosulose. *Fruit* (immature) 11 cm. long, 3 cm. wide, oblong

or oblong-oblongate, sparsely pilosulose basally on the margins, the carpophores 8-10 mm. long, pilosulose.

Type Collection: *B. Maguire* 24650, "overhanging upper Augustus Creek, Tafelberg, Surinam," Sept. 1944 (HOLOTYPE NY, isotypes F, MO, U, US).

Additional Specimens: BRITISH GUIANA: Makreba Falls, Kurupung River, Sept. 1938-Feb. 1939, *Pinkus* 258 (F, G, GH, MO, NY, US).

This species finds its nearest relative in *M. acaciaefolium*, but it is amply distinct both vegetatively and in its flowers and fruit. Its costa is strongly salient on both surfaces of the leaflets and its dark, shiny upper surface of the leaf-

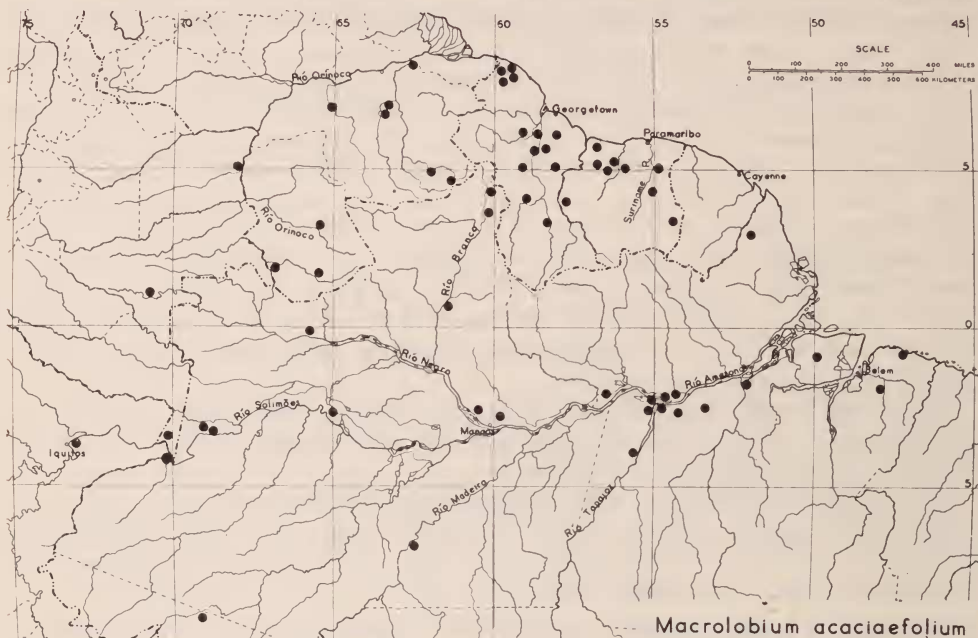


FIG. 4. Geographic distribution of *M. acaciaefolium*.

lets and the strongly glaucous under surface contrast sharply. In respect to the flowers, the lanulose puberulence of the bracteoles is distinctive. The fruit of *M. acaciaefolium* is oval, oblong-oval or nearly orbicular, whereas those of *M. long-racemosum* are oblong and about three to four times as long as wide.

8. *Macrolobium acaciaefolium* (Benth.) Benth. in Mart. Fl. Bras. 15(2): 224. 1870.
Figure 4.

Outea acaciaefolia Benth. Jour. Bot. Hook. 2: 94. 1840.

Vouapa acaciaefolia (Benth.) Baill. Hist. Pl. 2: 109. 1870.

Vuapa acaciaefolia (Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Macrolobium acaciaefolium (Benth.) Benth. var. *vestitum* Sandwith, Kew Bull. 1948: 312. 1948.

Tree with rather flattened, expanded crown, 3-30 m. tall, 8-100 cm. diameter, the branchlets glabrous to densely pilosulose. Petioles (2-)6-7(-12) mm. long, canaliculate. Leaf blades oblong, elliptic-oblong or lanceolate-oblong, (12-)15-20 (-28)-jugate, the pairs of leaflets (3-)5-7(-12) mm. apart; rachis (6.5-)10-14(-24) cm. long, glabrous or the axis puberulous or pilosulose on the upper surface and pilosulose beneath, the wings only ciliolate or the upper surface also puberulous or pilosulose, glabrous beneath. Leaflets (7-)20-25(-40) mm. long, (2-)5-7(-11)

mm. wide, the uppermost leaflets smallest, oblong, the base inequilateral, the upper side subobtusate to cordate, the lower side acute to obtuse, the apex rotund, retuse to emarginate, usually minutely apiculate; upper surface usually shiny, glabrous, or puberulous to pilosulose on the costa or sometimes more or less puberulous on the blade also, the lower surface glabrous to more or less strongly golden-pilose on the apical-lateral surface of the costa, extremely rarely pilosulose on part or all of the blade; costa impressed on the upper surface, salient beneath, the venules obscure to prominulous. *Inflorescences* (1-)2(-6) cm. long, densely grayish-pilosulose, infrequently with one basal branchlet, the peduncles (when present) about 4 mm. long; bracts caducous, (1.5-)3.5(-6) mm. long, (1-)2.5(-5) mm. wide, broadly ovate to oval, or oblong, concave, acute to cuspidate-acute, ciliolate, glabrous or rarely minutely strigulose near the base within, densely pilosulose externally; pedicels (1.5-)2.5(-5) mm. long, densely pilosulose; bracteoles (3.5-)5(-7) mm. long, (1.5-)3(-4) mm. wide, concave, obovate to oval to ovate, glabrous within, densely pilosulose externally. *Hypanthium* 1-2 mm. long, sessile or with a stipe 0.5 mm. long, glabrous or sparsely pilosulose basally. *Sepals* five, the adaxial pair partly united, 2.5-6.5 mm. long, 1-3.5 mm. wide, oblong to lanceolate, obtuse, acute, or acuminate, glabrous or rarely ciliolate sparsely at the apex. *Petal* blade 3-5.5 mm. long, 5-7.5 mm. wide, transversely oval, rarely suborbicular, the claw 3-5.5 mm. long, more or less auriculate, glabrous externally, villosulose within on the claw and over the center of the blade or the blade totally glabrous, the claw ciliolate in the lower part; 1-4 petalodia often present, to 5 mm. long, linear. *Filaments* (12-)15(-20) mm. long, glabrous. *Stigma* capitate. *Style* (9-)15(-20) mm. long, basally pilosulose. *Ovary* 2-3 mm. long, 1-1.5 mm. wide, oblong to oval or oblong-obovate, (1-)2(-3)-ovulate, the margins pilosulose, the lateral surfaces glabrous; gynophore 1-2.5 mm. long, pilosulose, the hairs usually directed basally, inserted at the base of the hypanthium or sometimes up to midway on its adaxial wall. *Fruit* indehiscent, 4.5-7 cm. long, 3-5.5 cm. wide, oblong to orbicular, flat, the adaxial margin thicker than the abaxial and sulcate, sparsely pilosulose on the margins, the carpophores 1-2.5(-6) mm. long, pilosulose. *Seeds* one per fruit, 3-4.5 cm. long, 2-3.5 cm. wide, flat, oval or oblong, the testa crustose, tan-brown to black, irregularly salient-venose.

Type Collection: *Robt. Schomburgk* 521, "Rooponoony and Essequibo Rivers," 1838 (HOLOTYPE K, isotypes BM, F, G, K, P, US, W).

Additional Specimens: BRAZIL: *Burchell* 9141 (GH); Rio de Janeiro, *Glaziou* 13755 (P). Pará: Rio Mapua, Canta Galo, municip. de Breves, July 1950, *Black, Froes & Ledoux* 50-9875 (NY); near Rio Jumunda, São Jorge, municip. Faro, Nov. 1950, *Black & Ledoux* 50-10700 (IAN); Tapajóz, Boa Vista, July 1932, *Capucho* 341 (F, IAN); Igarapé de Irera, near Santarém, Aug.-Sept. 1938, *Dahlgren s.n.* (F, US); Boa Vista, Rio Tapajóz, June 1929, *Dahlgren & Sella* 110 (F, US), 190 (F, NY); Oyapoc, June 1904, *Ducke* 4775 (G); Lago de Faro, Aug. 1907, *Ducke* 8398 (G); Rio Tapajóz, first rapids (S. Luiz), Dec. 1915, *Ducke* 15815 (G, US); Rio Oiapoque, Terr. Amapá, Feb. 1950, *Froes* 25911 (IAN, NY); Marabá, Rio Itacaúna, June 1949, *Froes & Black* 24385 (IAN, NY); Rio Purús, June 1903, *Goeldi* 3901 (G, US); Bas Xingú, Dec. 1903, *Goeldi* 4152 (G); Rio Maracá, July 1896, *Guedes* 614 (G); Marajó, June 1896, *Huber* 186 (G); Rio Capim, July 1897, *Huber* 911 (G, US); Quatipuru, Dec. 1899, *Huber* 1764 (G); Cassipa in Tapajóz R. region, Sept. 1931, *Krukoff* 1238 (A, F, G, MO, NY, P, U, UC); Monte Alegre, July 1908, *Sneathlage* 9562 (G); Santarém, June 1850, *Spruce* 920 (P); vic. Santarém, June 1850, *Spruce s.n.* (F-frag., G, GH, NY, P, W). Matto Grosso: Rio Santarém and Barbados, Jan.-Dec. 1928, *Riedel* 1568 (A, NY); "Matto Grosso et Santarém," *Riedel s.n.* (A); Rio Guaporé, July 1942, *Sandeman* 2143 (K). Amazonas: Tefé, beira do Chi-daruim, Aug. 1947, *Black* 47-1208 (IAN, U); Rio Janeiro, Manaus, Aug. 1948, *Corner* 8 (IAN, NY); São Paulo de Olivença, Rio Solimões, Igarapé Jaratuba, June 1940, *Ducke* 340 (Y); Rio Negro ad flum. Apuahu, July 1941, *Ducke* 757 (F, IAN, MO, NY, US); Manaus, Igarapé Guarita, April 1943, *Ducke* 1228 (IAN, MO, NY, US); Lago de Tefé, June 1906, *Ducke* 7369 (G); Rio Jatay, Riosinho Juruema, June 1945, *Froes* 21017 (IAN, NY); upper Rio Pacú, Terr. Rio Branco, March 1948, *Froes* 23152 (IAN); Taperinha

bei Santarém, 1927, *Ginzberger* 700 (F); Cachoeira Caranguejo, Rio Cauabury, Dec. 1930, *Holt & Blake* 546 (GH, NY, US); Terr. Acre, ca. mouth Rio Macauhan, Aug. 1933, *Krukoff* 5599 (A, F, MO, NY, U, UC, US); Tres Casas, Municip. Humaytá, Oct. 1934, *Krukoff* 6320 (A, F, MO, NY, U, US); São Paulo de Olivença near Palmares, Sept.-Oct. 1936, *Krukoff* 8403 (G, MO, U, US); Assahytuba, Rio Branco, Jan. 1924, *Kublmann* 1052 (H.J.B.R. No. 17663) (G, P, RB, U, US); São Marcos, upper Rio Branco, Sept. 1913, *Kublmann* 3243 (U, US); Ega, Oct. 1831, *Poeppig* 2724 (P, W); Serra de Mel, Rio Branco, Surumú, Sept. 1909, *Ule* 8147 (G, UC).

PERU: Loreto: Mishuyacu near Iquitos, June 1930, *Klug* 1417 (F, NY, US); "stromgebiet des Maronon von Iquitos aufwärts bis zur Santiago-Mundung de Manseriche ca. 77° 30' West," 1924, *Tessmann* 3673 (F-frag., G, NY); Manfina on upper Río Nanay, June-July 1929, *Williams* 1098 (F, US); Caballo-Cocha on Amazon River, Aug. 1929, *Williams* 2420 (F, G, US).

COLOMBIA: Vicinity Miraflores, Río Vaupés, Vaupes, Nov. 1945, *Allen* 3394 (MO, US); Los Llanos, Río Orinoco, Puerto Carreño, Vichada, Oct. 1938, *Cuatrecasas* 4008 (F, US); bocas del Carurú, Vaupes, Sept. 1939, *Cuatrecasas* 7042 (F, US); Loretoyacu River, Nov. 1946, *Schultes & Black* 8640 (US).

VENEZUELA: Margin of Río Orinoco, *Chaffanjon s.n.* (P). Bolívar: Mouth of Río Tonoro, alto Río Paragua, Aug. 1943, *Cardona* 815 (NY, US, VEN); Raudal Uraima, alto Río Paragua, Sept. 1943, *Cardona* 885 (F, NY, US, VEN); Río Caroní, from Kusaribara to mouth of Río Ikabaru, Sept. 1946, *Cardona* 1649 (VEN); banks of Río Caroní and tributaries, Oct. 1947, *Cardona* 2182 (US, VEN); alto Río Caroní, Jan. 1949, *Cardona* 2564 (NY); Río Paragua between Río Tonoro and Salto de Auraima, April 1943, *Killip* 37541 (UC, US, VEN); Río Paragua, Dec. 1951, *Maguire* 32712 (F, K, NY, US, VEN); Río Uairén, Sta. Elena, Gran Sabana, March 1946, *Tamayo* 3180 (VEN); La Unión, Río Caura, Feb. 1939, *Williams* 11244 (F, US, VEN). Amazonas: Río Cunucunuma, just above Playa Alta, Nov. 1950, *Maguire, Cowan & Wurdack* 29504 (F, G, GH, IAN, K, MO, NY, U, US, VEN); San Carlos, Río Negro, Feb. 1942, *Williams* 14485 (F, US, VEN); Caño Macasi, Capihuara, alto Casiquiare, alt. 120 m., May 1942, *Williams* 15596 (F, NY, US, VEN).

BRITISH GUIANA: Pomeroon Dist., Santa Rosa, Maruka R., Aug. 1921, *de la Cruz* 995 (GH, NY, US); Acqueero Landing, Pomeroon Dist., Sept. 1921, *de la Cruz* 1095 (GH, NY, US); Baramani R., NW Dist., Sept. 1921, *de la Cruz* 1137 (GH, NY, US); near Bartica on Essequibo R., Sept. 1922, *de la Cruz* 1925 (F, GH, MO, NY, UC, US); Waramuri Mission, Moruka R., Pomeroon Dist., Oct. 1922, *de la Cruz* 2583 (F, GH, MO, NY, UC, US); Waini R., NW Dist., April 1923, *de la Cruz* 3738 (G, GH, MO, NY, UC, US); Assakatta, NW Dist., Sept. 1923, *de la Cruz* 4373 (GH, MO, NY, UC, US); Mazaruni R., Oct. 1944, *Fanshawe* 2012 (F.D. 4748) (TYPE COLLECTION of *M. acaciaefolium* var. *vestitum* Sandw., HOLOTYPE K, isotypes BGF, F, NY, U, US); Apoteri, Rupununi R., July 1931, *For. Dept.* 2101 (BGF); Rockstone on Essequibo R., July 1921, *Gleason* 874 (GH, NY, US); Berbice, below Koyeri Creek, Wurawa R., Canje R., Dec. 1914, *Hobenkerk* (F.D. No.) 685 (BGF); Demerara R., Great Falls, June 1896, *Jenman* 7172 (NY); Mallali, Oct. 1924, *Persaud* 163 (F, NY); Essequibo R., at first falls, Sept. 1929, *Sandwith* 222 (NY, P, U, US); Roraima, 1842-43, *Rich. Schomburgk* 456 (P, W); British Guiana, *Rich. Schomburgk* 737 (P); British Guiana, *Rich. Schomburgk s.n.* (U); Karenambo, Rupununi R. Basin, Oct. 1939, *A. C. Smith* 2231 (A, F, G, MO, NY, U, US, Y).

SURINAM: Nickeri-Nanni Creek, Dohsen Savanna, Oct. 1941, *Geyskes* 124 and 126 (NY, U); Kaboerie Kreek, Nickerie, June 1916, *Gonggrypp* (*For. Bur. No.*) 2210 (U); Turco Tabbetje, fluv. Marowijne, July 1923, *Gonggrypp* (*For. Bur. No.*) 5325 (U, US); Coppename R., near Kaaimanstone, Sept. 1933, *Lanjouw* 704 (U, US); Corantijn, New R., Sept. 1935, *Rombouts* 179 (MO, U); Litanie R., July 1937, *Rombouts* 712 (IAN, U); Corantien near Wonotobo, Oct. 1916, *Stabel & Gonggrypp* (*For. Bur. No.*) 2534 (IAN, U); Kaboerie, Corantijn R., Oct. 1916, *Stabel & Gonggrypp* (*For. Bur. No.*) 2988 (MO, U); fluv. Gonini, Aug. 1903, *Versteeg* 120 (U).

Vernacular Names: Brazil: "arapary," "faveira arapury," "parapari"; Peru: "pashaquilla," "arapari"; Venezuela: "arepillo," "arepito."

This is an extremely variable species within which there may even be some subspecific taxa, but no constant characters have been discovered in this study which could be used to distinguish them.

In vestiture there is marked variability. The leaflets are typically pubescent on the costa on the upper surface and on the apical-lateral surface of the costa beneath. However, collections from eastern Peru and Colombia have the upper half of the blades more or less pubescent beneath. This pubescence distribution might

be of some taxonomic use, were it more constant and correlated with other more significant differences. Unfortunately, such is not the case, for this character appears to vary independently of all others. Collections which exhibit this pubescence distribution are: *Tessmann* 3673, *Schultes & Black* 8640, *Cuatrecasas* 4008 and *Allen* 3394. In the upper Rio Negro country a form occurs which is completely pilose on the undersurface of the leaflets, represented by *Williams* 14485 and *Maguire, Cowan, & Wurdack* 29504. However, this is the only distinguishing character and is considered to be only one extreme in the pubescence variation pattern.

There is another variant group with no geographic or morphologic character other than that it has generally larger leaflets. As with the pubescence, it is held that no useful purpose is served by the recognition of subspecific taxa in what appears to be a continuous system of variability.

Var. *vestitum*, here treated as a synonym of this species, was described by Sandwith to include that portion of the species which exhibits pubescent branchlets but even the type collection shows scattered hairs on the branchlets of some of the sheets observed. Actually, the branchlets may be glabrous, pilosulose in a small area just above each node, sparsely but generally pilosulose, or densely pilosulose.

This species is so similar to *M. longeracemosum* in aspect that some of the material of that species had been determined as *M. acaciaefolium* and there is no doubt that the two are intimately related. They are, however, separable on a number of characters both in the vegetative phase and in the reproductive structures. Whereas *M. longeracemosum* has the leaflet costa strongly salient on the upper surface, in the present species it is impressed. Also, the leaflets of *M. acaciaefolium* do not display the sharply contrasting dark-lustrous upper surface and strongly glaucous undersurface as do those of *M. longeracemosum*. The pubescence of the bracteoles and pedicels of the latter is quite different from that on the same structures in *M. acaciaefolium*. The fruits of the latter are oval, oblong-oval, or orbicular, and indehiscent, in contrast to the elongate-oblong fruits produced by its nearest relative.

9. *Macrolobium froesii* Cowan, sp. nov. Figure 5.

Arbor 10 m. alta, 15 cm. diametro, ramulis dense pilosulis. Stipulae circa 10-15 mm. longae, 1 mm. latae, caducae, lineares, caudato-acuminatae, extus pilosulae, intus glabrae. Petioli 3-4 mm. longi, pilosuli. Foliorum lamina lanceolato-oblonga, 7-20-jugata, paribus 5-9 mm. separatis; rachibus 9-15 cm. longis, supra puberulis, infra pilosulis. Foliola 10-30 mm. longa, 5-10 mm. lata, oblonga, ad basim inaequilateralia, basis latere superiore cordato, inferiore subobtusum, ad apicem rotundato-obtusum, retusum, minute apiculatum, in costa supra plus minusve pilosula et infra sparse pilosula; costa impressa supra, infra salienti, venulis obscuris. Inflorescentiae 3.5 cm. longae, terminales, axe dense puberulo; bracteis 2.5 mm. longis, 1.5 mm. latis, ovatis, caducis, intus glabris, extus puberulis; pedicello 1-2 mm. longo, dense puberulo; bracteolis 6 mm. longis, 3 mm. latis, ellipticis, acutis, intus villosulis, puberulis extus. Hypanthium 1.5 mm. longum, glabrum. Sepala quinque, 3.5 mm. longa, 1-1.5 mm. lata, lanceolata, acuminata, glabra. Petali lamina 3.5 mm. longa, 4.5 mm. lata, transverse ovalis, unguicilo 7 mm. longo, subauriculato. Filamenta 20 mm. longa, glabra. Stigma capitellatum. Stylus 19.5 mm. longus, ad basim pilosulus. Ovarium 2 mm. longum, 1 mm. latum, ovale, marginibus pilosulis, lateribus glabris, 2-ovulatum, gynophoro 3 mm. longo, pilosulo. Fructus ignotus.

Type Collection: *R. L. Froes* 22232, "high forest on high land, Cach. Macarico, Rio Icana, Rio Negro," Amazonas, Brazil, April 26, 1947 (HOLOTYPE NY, isotypes IAN, U).

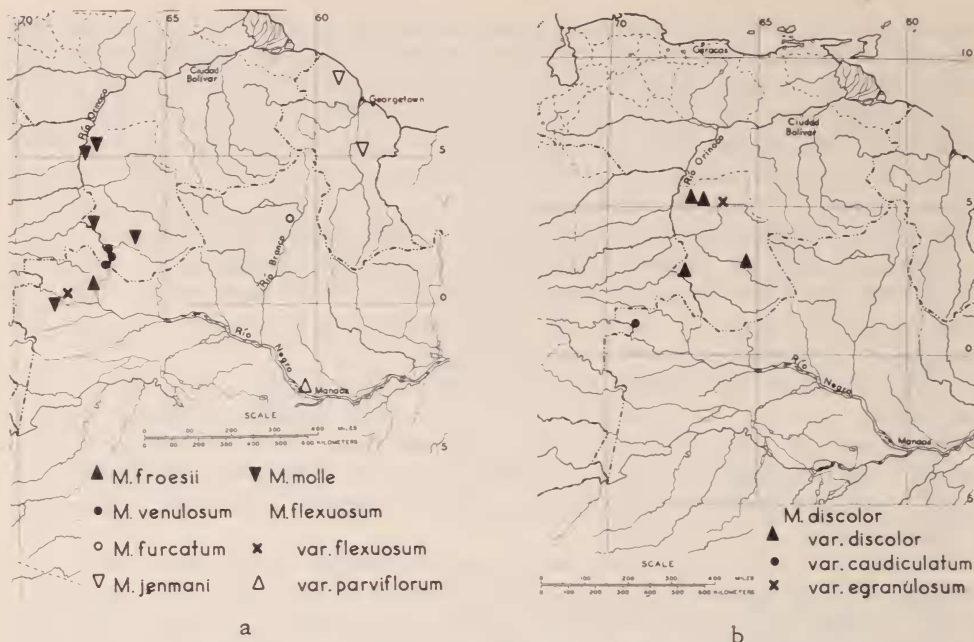


FIG. 5. a. Distribution of *M. froesii*, *M. venulosum*, *M. furcatum*, *M. jønmani*, *M. molle*, and *M. flexuosum*. b. Distribution of *M. discolor*.

The relationship between this new species and *M. venulosum* is not exceptionally close but is probably the nearest which can be assumed from the available evidence. The two species differ in the shape of the leaflet apices, the length of the pedicels, the pubescence of the bracteoles, and the filament length and pubescence.

10. *Macrolobium venulosum* Benth. in Mart. Fl. Bras. 15(2): 223. 1870. Figure 5a.

Vouapa venulosa (Benth.) Taub. Bot. Centralbl. 47: 394. 1891.

Vuapa venulosa (Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Tall shrub with puberulous branchlets. *Stipules* 4 mm. long, caducous, sublanceolate, acuminate, puberulous. *Petioles* 2-6.5 mm. long, canaliculate, puberulous. *Leaf blades* oblong or oblong-lanceolate, 13-19-jugate, the pairs of leaflets 3-10 mm. apart. *Leaflets* 6-26 mm. long, 3-7 mm. wide, oblong, the base inequilateral, the upper side more or less obtuse, the lower side acute, the apex truncate-obtuse, retuse to emarginate, glabrous or sparsely puberulous at the base, sometimes generally pilosulose on the lower surface; costa impressed or plane on the upper surface, salient beneath, the venules obscure to prominulous. *Inflorescences* 2.5-4 cm. long, the axis puberulous, peduncles 1.5-5 mm. long; pedicels 2.5-3.5 mm. long, puberulous; bracteoles 7 mm. long, 3.5 mm. wide, elliptic, acute to acuminate, sparsely pilosulose in the apical portion within, puberulous externally, ciliolate. *Hypanthium* 1.5 mm. long, glabrous. *Sepals* four, 3.5-4 mm. long, 1-2 mm. wide, triangular-lanceolate, the adaxial one acute, the others caudate-acuminate, sparsely ciliolate. *Petal* claw about 3.5 mm. long, the complete blade not seen. *Filaments* about 11 mm. long, villosulose near the base. *Stigma* capitellate. *Style* about 8 mm. long. *Ovary* 4 mm. long, 1.5 mm. wide, oblong, finely puberulous on one or both sutures, the lateral surfaces glabrous, the gynophore 2.5 mm. long, minutely puberulous, inserted on base of the hypanthium. *Fruit* (immature to sub-

mature) 7-7.5 cm. long, 2.5 cm. wide, oblong, sometimes broader toward the apex, glabrous or with a few marginal hairs, the carpophores 8-13 mm. long, puberulous.

Type Collection: *R. Spruce 3133*, "San Carlos," Río Negro, Amazonas, Venezuela, Oct. 1853 (HOLOTYPE K, isotypes G, GH, NY, P, US-frag., W).

Additional Specimens: COLOMBIA: Río Negro, vicinity Piedra de Cocui, Vaupes, Dec. 1947, *Schultes & Lopez 9530* (US).

There are two sheets bearing the type collection number at Geneva, one of which is a fruiting specimen. The latter may be part of a second Spruce collection, for the leaflets are smaller and pilosulose on the lower surface. Also, it has shorter petioles and rachises. It is certain that Bentham did not study this material because he specifically states in his original description of the species that he had no fruit available for his examination.

This species shows the greatest affinity with *M. flexuosum*, particularly with var. *parviflorum* of that species. It differs from that variety by having smaller leaflets which are usually glabrous, closer to each other, and the ovary is marginally puberulous instead of pilosulose. From *M. froesii*, to which it also bears some relationship, it may be separated by the shape of the leaflet apex, the length of the pedicels, and the pubescence of the bracteoles and filaments.

11. *Macrolobium flexuosum* Spruce ex Benth. in Mart. Fl. Bras. 15(2): 223. 1870.

Figure 5a.

Tree 7-10 m. tall, the branchlets puberulous or pilose. *Petioles* 6-9 mm. long, sulcate lightly or canaliculate on the upper surface, pilosulose or puberulous. *Leaf blades* oblong-elliptic or broadly elliptic, 10-16-jugate, the pairs of leaflets 9-20 mm. apart; rachis 11-21.5 cm. long, pilosulose, or sparsely puberulous on the axis and the wing margins. *Leaflets* 11-45 mm. long, 5-15 mm. wide, oblong, the base inequilateral, the upper side obtuse to subcordate, the lower side acute to subobtuse, the apex rotund or truncate, obtusely or acutely emarginate; upper surface lustrous, glabrous except puberulous on the costa, the hairs uncinatate or arcuate, beneath pilosulose, sometimes sparingly so, costa more strongly pubescent; costa impressed or subsalient above, salient beneath, the venules numerous, closely parallel, prominent on both surfaces or obscure beneath. *Inflorescences* 3.5-6.5 cm. long, rarely with a lateral branchlet, the axis puberulous, the peduncle 1-2 mm. long; bracts 1.5-3 mm. long, 1.5 mm. wide, early caducous, triangular-ovate, ciliolate, glabrous within, puberulous or short-pilosulose externally; pedicels 2-3.5 mm. long, puberulous; bracteoles 5-6.5 mm. long, 3-3.5 mm. wide, elliptic, cuspidate-acute, appressed-puberulous or short-pilosulose externally, villosulose within. *Hypanthium* 1.5-2 mm. long, glabrous or sparsely pilosulose. *Sepals* five, free or the adaxial pair slightly united at the base, the dorsal pair 2-2.5 mm. long, 1.5 mm. wide, triangular, the others 3-3.5 mm. long, 1.5-3 mm. wide, oblong to oval or lanceolate, ciliolate apically. *Petal* blade 3.5 mm. long, 4 mm. wide, suborbicular, pilosulose up to the center externally, glabrous or villosulose sparsely within, the claw 4-7.5 mm. long, glabrous or pilosulose externally, ciliolate, villosulose within. *Filaments* villosulose basally. *Stigma* simple or capitate. *Style* pilosulose at the base. *Ovary* 1.5-2 mm. long, 1-1.5 mm. wide, linear-elliptic or oblong, marginally pilosulose or villosulose, laterally pilosulose or glabrous, 2-4-ovulate, the gynophore 1.5-2 mm. long, pilosulose, inserted in the base of the hypanthium. *Fruit* unknown.

Key to the Varieties of *Macrolobium flexuosum*

1. Ovary pubescent throughout; bracts 3 mm. long; bracteoles 6.5 mm. long; hypanthium sparsely pilosulose; leaves 10-11-jugate, rachis pilosulose; leaflets rotund and acutely emarginate at apex. 11a. var. *flexuosum*.

1. Ovary pubescent only on margins; bracts and bracteoles shorter; hypanthium glabrous; leaves 10-16-jugate, rachis sparsely puberulous on axis and wing margins; leaflets truncate and obtusely emarginate at apex. 11b. var. *parviflorum*.

11a. *Macrolobium flexuosum* var. *flexuosum*. Figure 5a.

Vouapa flexuosa (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 393. 1891.

Vuapa flexuosa (Spruce ex Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Tree with flexuose branches, 5 m. tall, the branchlets pilose. *Leaf blades* oblong-elliptic, 10-11-jugate, the pairs of leaflets 10-16 mm. apart; rachis 11-14 cm. long, pilosulose. *Leaflet* base obtuse on the upper side, acute on the lower side, the apex rotund and acutely emarginate, the costa impressed above, the venules obscure on the under surface. *Inflorescences* 3.5-4.5 cm. long; bracts 3 mm. long, 1.5 mm. wide, puberulous on the outer surface; bracteoles 6.5 mm. long, 3.5 mm. wide, appressed-puberulous on the outer surface. *Hypanthium* 2 mm. long, sparsely pilosulose. *Sepals* with the adaxial pair united at the base. *Petal* blade about 4 mm. in diameter, orbicular, the claw 7-7.5 mm. long. *Filaments* about 15 mm. long. *Ovary* pilose marginally, puberulous on the lateral surfaces, 4-ovulate.

Type Collection: R. Spruce 2593, "Falls of Panure," Rio Vaupés, Amazonas, Brazil, Sept. 1852 (HOLOTYPE K, isotypes G, GH, NY, P, W). Known only by the type collection.

11b. *Macrolobium flexuosum* var. *parviflorum* (Ducke) Cowan, comb. nov. Figure 5a.

Macrolobium parviflorum Ducke, Bol. Têc. Inst. Agron. Norte [Belém] 2: 11. 1944.

Small tree with puberulous branchlets. *Leaf blades* broadly elliptic, 10-16-jugate, the pairs of leaflets 9-20 mm. apart; rachis 12-21.5 cm. long, sparsely puberulous on the axis and wing margins. *Leaflet* base subcordate on the upper side, subobtuse on the lower side, the apex truncate and obtusely emarginate, the costa subsalient on the upper surface, the venules prominent. *Inflorescences* 3.5-6.5 cm. long; bracts 1.5 mm. long, 1.5 mm. wide, short-pilosulose on the outer surface; bracteoles 5 mm. long, 3 mm. wide, short-pilosulose externally. *Hypanthium* 1.5 mm. long, glabrous. *Sepals* free. *Petal* blade 3.5 mm. diameter, the claw 4 mm. long. *Ovary* pilosulose marginally, the lateral surfaces glabrous, 2-ovulate.

Type Collection: A. Ducke 1418 (H.J.B.R. 50739), "Cachoeira Grande, Manaós," Amazonas, Brazil, Oct. 1943 (HOLOTYPE RB, isotypes A, F, IAN, NY, US). Known only by the type collection.

Macrolobium flexuosum appears to be near the terminus of one of the side-lines of relationship which has *M. brevense* at its base. Its closest relatives are *M. venulosum* and *M. furcatum*. It may be separated from the former by the type of pubescence on the ovary, pubescence of the bracteoles, and the number of sepals. From *M. furcatum* it differs by its pubescent inner surface of the bracteoles and by its pubescent filaments. Var. *parviflorum* may be further distinguished from *M. furcatum* by the leaf outline, the length of the leaves and the size and pubescence of the bracts.

The most important differences separating the two varieties of this species are the distribution of the pubescence on the ovary, the shape of the leaflet apices, and the size of the bracts and bracteoles.

It is an unusual circumstance that Ducke failed to relate his *M. parviflorum* to *M. flexuosum*, for he rarely has been at fault in his opinions regarding the relationships of his new species in this genus. The proximity of relationship is unmistakable but the differences are not of specific stature.

12. *Macrolobium furcatum* Ducke, Bol. Têc. Inst. Agron. Norte [Belém] 2: 12. 1944. Figure 5a.

Tree to 20 m. tall, the branchlets and leaflets glabrous. *Petioles* 8-12 mm. long, canaliculate, glabrous or with a very few scattered hairs. *Leaf blade* oblong, 11-14-jugate, the pairs of leaflets 8-12 mm. apart; rachis 9.5-12 cm. long, glabrous or rarely with few scattered hairs on the upper surface of the wings. *Leaflets* 16-32 mm. long, 6-10 mm. wide, oval-oblong, the base inequilateral, the upper side cordate, the lower obtuse, the apex rotund, slightly retuse, apiculate minutely, the costa impressed on the upper surface, salient beneath, the venules prominulous. *Inflorescence* 4.5-5 cm. long, 1-2 lateral branchlets frequently present, the axis sparsely short-pilosulose, the peduncles 4-6 mm. long, glabrous or very sparsely short-pilosulose; bracts 5 mm. long, 2.5 mm. wide, caducous, ovate, acute, glabrous except for the ciliolate margins; pedicels 3 mm. long, very sparsely short-pilosulose; bracteoles 7 mm. long, 3.5 mm. wide, oblong-obovate, abruptly acute, glabrous except for a few hairs at the apex. *Hypanthium* 2 mm. long, sessile, glabrous. *Sepals* five, the adaxial pair nearly completely united, 4.5-5 mm. long, 1-1.5 mm. wide, linear-oblong. *Petal* blade 4.5 mm. long, 6 mm. wide, transversely oval, the claw 5 mm. long, auriculate, glabrous. *Filaments* 16.5 mm. long, glabrous. *Stigma* capitellate. *Style* over 16.5 mm. long, glabrous. *Ovary* 2.5 mm. long, 1 mm. wide, oval-oblong, 2-ovulate, glabrous, the gynophore about 1.5 mm. long, sparsely pilosulose, inserted midway on the adaxial wall of the hypanthium. *Fruit* unknown.

Type Collection: A. Ducke 1394 (H.J.B.R. No. 50738), "Bôa Vista, Rio Branco," Amazonas, Brazil, Aug. 1943 (HOLOTYPE RB, isotypes A, F, IAN, NY, US). Known only by the type collection.

The affinity of *M. furcatum* for *M. flexuosum*, and in particular for var. *parviflorum* of the latter species, is quite clear. It differs from *M. flexuosum* by its glabrous bracteoles and filaments, and it may be further distinguished from var. *parviflorum* by the outline and length of the leaf blades and by the size and pubescence of the bracts.

13. *Macrobium molle* (Benth.) Cowan, comb. nov. Figure 5a.

Macrobium flexuosum Spruce ex Benth. var. *molle* Benth. in Mart. Fl. Bras. 15(2): 223. 1870.

Tree 8-18 m. tall, to 38 cm. in diameter, the branchlets densely pilose. *Stipules* 5-19 mm. long, 1-2 mm. wide, caducous, subulate or falcate-linear, acuminate, densely papillose-puberulous on the inner surface, densely pilosulose outside. *Petioles* 7-15 mm. long, sulcate at the apex. *Leaf blades* oblong or oval-oblong, 4-10-jugate, the pairs of leaflets 6-20 mm. apart; rachis (4-)5(-10.5) cm. long, puberulous on the upper surface, pilosulose beneath. *Leaflets* (20-)30(-63) mm. long, (8-)12(-23) mm. wide, oblong, the base inequilateral, the upper side subcordate to cordate, the lower side acute to subobtuse, the apex rotund, entire to retuse, sometimes minutely apiculate; upper surface velvety-puberulous, punctate and densely beneath, the lateral surfaces of the costa more densely pubescent than blade; costa plane to subimpressed on the upper surface, salient beneath, the venules usually obscure, sometimes subprominulous. *Inflorescence* 3-8.5 cm. long, the axis pilosulose, the peduncle 9-23 mm. long; bracts 1.5 mm. long, 0.5 mm. wide, early caducous, triangular, acute, ciliolate, strigulose on the inner surface, pilosulose externally; pedicels 2-4 mm. long, pilosulose; bracteoles 6 mm. long, 3-3.5 mm. wide, elliptic or oval-elliptic, pilosulose. *Hypanthium* 1 mm. long, glabrous, sessile. *Sepals* five, the adaxial pair partly united, 1.5-3 mm. long, 0.5-2 mm. wide, lanceolate, acuminate to caudate-acuminate, ciliolate apically. *Petal* blade 3-4.5 mm. long, 3.5-5 mm. wide, transversely oval, glabrous externally, villose on the inner surface up to and over the center, the claw 2.5-3.5 mm. long, auriculate, ciliolate at the base, more or less villosulose on the inner

surface. *Filaments* 10-12.5 mm. long, villosulose near the base. *Stigma* capitellate or only very slightly swollen. *Style* 10-12 mm. long, pilosulose basally. *Ovary* 2-2.5 mm. long, 1-1.5 mm. wide, oval, (1-)2-ovulate, pilosulose marginally, the lateral surfaces glabrous; gynophore 1.5 mm. long, pilosulose, inserted on the base of the hypanthium. *Fruit* 5-7.5 cm. long, 3.5-4.5 cm. wide, oblong to oval, glabrous or the margins sparsely pilosulose, the carpophores 2-7.5 mm. long, sparsely pilosulose. *Seeds* one per fruit, 2-2.5 cm. in diameter, suborbicular, flat, the testa membranous, irregularly venose.

LECTOTYPE: *R. Spruce* 2408, "Falls of São Gabriel, igapo," Rio Uaupés, Brazil, Aug. 1852 (deposited K, isolectotypes F-frag., G, GH, NY, P, US, W).

Additional Specimens: BRAZIL: Ad flum. Casiquiari, Vasiva et Pacimoni, Jan. 1854, *Spruce* 3330 (K, NY, P, W). VENEZUELA: Amazonas: Puerto Ayacucho, May 1940, *Williams* 13050 (F, US, VEN); Maroa, Río Guainia, Feb. 1942, *Williams* 14251 (F, US, VEN); Caño S. Miguel, Guainia, alto Río Negro, March 1942, *Williams* 14880 (F, US, VEN); Río Sanariapo, above Raudal Maipures, July 1942, *Williams* 15976 (F, MO-frag., NY, US, VEN).

Vernacular Names: Venezuela: "ahuiapa" (Baniba); "arepillo"; "arepito"; "guape" (Quariqueño); "macuca" (Baniba).

It was assumed by Bentham that the differences separating this taxon from typical *M. flexuosum* were the greater density of pubescence on the leaflets and its longer inflorescences and he considered it only as a variety. However, there are additional differences which, with the ones he recognized, are adequate for the recognition of it as a distinct species. *M. molle* is generally puberulous over the upper leaflet surface, puberulous only on the costa in *M. flexuosum*; the rachis of *M. molle* is shorter and bears fewer pairs of leaflets than that of *M. flexuosum*; the peduncle of *M. molle* is 9-23 mm. long, in contrast to the 1-2 mm. one of its relative; the typical variety of *M. flexuosum* has completely pubescent ovaries which are 4-ovulate, whereas in *M. molle* the lateral surfaces are glabrous and the ovary is 1-2-ovulate, as in var. *parviflorum*.

The systematic position of this species is much nearer *M. multijugum* than to *M. flexuosum*; this alliance is most obvious in the relatively elongate peduncles of both. *M. molle* differs from its nearest relative in having pilose branchlets, as compared to glabrous, much longer petioles, and pubescent leaflets.

14. *Macrolobium jenmanii* (Gleason) Sandwith, *Lloydia* 2: 185. 1939. Figure 5a.

Vouapa jenmani Gleason, Bull. Torrey Club 54: 609. 1927.

Tree 3 m. tall, the branchlets puberulous, glabrescent. *Petioles* 8-15 mm. long, subulate-canaliculate, pilosulose on the upper surface, glabrescent. *Leaf blades* 4-6-jugate, the pairs of leaflets 12-23 mm. apart, the rachis 5-10 cm. long, pilosulose on the upper surface, glabrescent, glabrous beneath. *Leaflets* 3.5-10 cm. long, 1-2.5 cm. wide, glabrous, oblong-lanceolate or lanceolate, the base inequilateral, obtuse, the apex acute, mucronate; costa slightly impressed above, strongly salient beneath, the venules prominulous. *Inflorescences* 5.5-8 cm. long, the axis puberulous, the peduncle 2-3 mm. long; bracts 7 mm. long, 3 mm. wide, caducous, ovate-lanceolate, ciliolate, glabrous within, puberulous externally; pedicels 2.5-3.5 mm. long, puberulous; bracteoles 8 mm. long, 3.5 mm. wide, oblong-oblancoolate, sparsely villosulose within, puberulous externally, cuspidate. *Hypanthium* 1.5 mm. long, glabrous. *Sepals* five, the adaxial pair partly united, 4-5 mm. long, 1-1.5 mm. wide, linear, glabrous. *Petal* blade 5 mm. long, 7.5 mm. wide, transversely oval, within villosulose in the throat, glabrous externally, the claw 5-8 mm. long, auriculate, glabrous externally, sparsely villosulose within. *Filaments* about 22 mm. long, sparsely villosulose in the lower part. *Stigma* capitellate. *Style* about 20 mm. long, with few basal hairs. *Ovary* 3 mm. long, 1.5 mm. wide, oblong-oblancoolate, 2-ovulate, pilosulose on the margins, glabrous on the lateral sur-

faces; gynophore 2 mm. long, puberulous, inserted near the apex of the adaxial wall of the hypanthium. *Fruit* 12.5-15.5 cm. long, 7.5-9 cm. wide, broadly oblong, the adaxial margin subulate, glabrous, the carpophores 3-10 mm. long, glabrous. *Seeds* 5 cm. long, 3.5 cm. wide, inequilaterally ovate, the testa sordid-brown with reticulate black lines.

Type Collection: *G. S. Jenman 4076*, "upper Demerara R.," British Guiana, Sept. 1887 (HOLOTYPE NY).

Additional Specimens: BRITISH GUIANA: Waramuri Mission, Moruka R., Pomeroy Dist., Oct. 1922, *de la Cruz 2534* (F, GH, MO, NY, UC, US).

Although *M. jenmanii* is probably properly situated in an advanced position in the multijugate line of relationship, its exact kinship is difficult to determine. It is not at all closely related to any of the species in this association but more than likely represents a short, divergent line from the main line of relationship which has ended blindly. It is easily distinguished by the shape and size of its leaflets and especially by the dimensions of its legumes. The immensity of the latter is rivaled only by the size of those of *M. brevense* but the two species are very different otherwise.

15. *Macrolobium discolor* Benth. in Mart. Fl. Bras. 15(2): 222. 1870. Figure 5b.

Shrub or tree 2-5 m. tall, the branchlets pilosulose, or pilosulose and puberulous. *Stipules* 5-6 mm. long, 0.5-1 mm. wide, subulate, acute to acuminate, early caducous. *Petioles* 2-10 mm. long, shallowly canaliculate, pilosulose or pilosulose and puberulous. *Leaf blades* 3-7-jugate, the pairs of leaflets 8-32 mm. apart; rachis 2.5-10 cm. long, canaliculate to slightly sulcate on the upper surface, pilosulose or pilosulose and puberulous. *Leaflets* 1.5-7 cm. long, 0.5-3.5 cm. wide, oblong, oblong-oval, or oblong-obovate, the base inequilateral, the upper side subobtuse, obtuse, or cordate, the lower side subobtuse to obtuse, the apex rotund, slightly retuse to emarginate, minutely apiculate; lustrous above, glabrous except uncinately puberulous on the costa, the lower surface pallid, glaucous, granulose-ceriferous or not, glabrous, or the costa puberulous or sparingly pilosulose; costa plane or impressed on the upper surface, salient beneath, the venules prominent. *Inflorescences* 3-13.5 cm. long, terminal or axillary, the axis puberulous or pilosulose and puberulous, the peduncle 2-6 mm. long; bracts 2.5-5 mm. long, 1.5-2 mm. wide, lanceolate, triangular-lanceolate, or oblong-oval, ciliolate, puberulous externally or only on the costa, glabrous within; pedicels 1-5 mm. long, puberulous or pilosulose and puberulous; bracteoles 5.5-12 mm. long, 3.5-6 mm. wide, elliptic or oval broadly, acuminate or caudate-acuminate, puberulous on the outer surface, glabrous, sparsely puberulous, or strigulose within. *Hypanthium* 1-2 mm. long, glabrous or more or less puberulous. *Sepals* five, free or the adaxial pair somewhat united, sometimes dimorphic, lanceolate or oblong, acute to long-acuminate, glabrous or more or less ciliolate. *Petal* blade 3.5-7 mm. long, 5-6 mm. wide, transversely oval to suborbicular, glabrous, the claw 4-12.5 mm. long, villosulose basally on the outer surface, glabrous or sparsely villosulose on the inner surface, ciliolate basally. *Filaments* 20-25 mm. long, sparsely villosulose basally. *Stigma* capitate to capitellate. *Style* 19-23 mm. long, lower part pilosulose. *Ovary* 1.5-3 mm. long, 1-1.5 mm. wide, linear to oblong, on the margins short-pilosulose, pilosulose, or villose, the lateral surfaces glabrous, 2-6-ovulate; gynophore 2-3 mm. long, pilosulose or puberulous, inserted at any point between the base and the margin of the adaxial hypanthial wall. *Fruit* (immature) 6-8.5 cm. long, 2-2.5 cm. wide, subfalcate-oblong, sparsely pilosulose on the margins, the carpophores 4-5 mm. long, pilosulose. *Seeds* 1.5 cm. in diameter, orbicular, the testa brown, very thinly membranous.

Key to the Varieties of *Macrolobium discolor*

1. Leaflets microscopically granulose-ceriferous on lower surface, margins narrowly involute; bracts 4.5-5 mm. long; bracteoles 8.5-12 mm. long; ovary pilosulose marginally. 2.
1. Leaflets pallid beneath but not granulose-ceriferous, margins plane; bracts 2.5 mm. long; bracteoles 5.5-6.5 mm. long; ovary villose marginally. . . 15c. var. *egranulosum*.
2. Undersurface of leaflets glabrous or sometimes with very few hairs on costa base; sepals dimorphic, adaxial pair 2.5-3 mm. long. 15b. var. *discolor*.
2. Undersurface of leaflets sparingly pilosulose; sepals homomorphic, adaxial pair 4-4.5 mm. long. 15a. var. *caudiculatum*.

15a. *Macrolobium discolor* var. *caudiculatum* (Ducke) Cowan, comb. nov. Figure 5b.

Macrolobium caudiculatum Ducke, Trop. Woods 65: 28. 1941.

Small tree, the branchlets pilosulose and puberulous. *Stipules* 5 mm. long, 1 mm. wide, lanceolate, acute, short-pilosulose externally, glabrous within. *Petioles* 4-5 mm. long, both the petioles and the rachis pilosulose and puberulous. *Leaf blades* 4-6-jugate, the pairs 20-25 mm. apart. *Leaflets* 3-5 cm. long, 1.5-2.5 cm. wide, the base subobtuse, the apex slightly retuse, the lower surface sparingly pilosulose. *Inflorescence* 5.5 cm. long, the axis pilosulose and puberulous, terminal or axillary; bracts 5 mm. long, triangular-lanceolate, the outer surface puberulous; pedicels 2-2.5 mm. long; bracteoles broadly oval, 9.5 mm. long, 4.5 mm. wide, puberulous externally, sparingly strigulose within. *Sepals* 4-5.5 mm. long, lanceolate or oblong, sparsely ciliolate. *Petal* not seen. *Filaments* villosulose in the lower part. *Ovary* short-pilosulose on the margins, the gynophore 3 mm. long, puberulous, inserted at the base of the hypanthium. *Fruit* unknown.

Type Collection: A. Ducke (H.J.B.R. No.) 24064, "baixo Uaupés," Amazonas, Brazil, Nov. 1932 (HOLOTYPE RB). Known only by the type collection.

15b. *Macrolobium discolor* var. *discolor*. Figure 5b.

Vouapa discolor (Benth.) Taub. Bot. Centralbl. 47: 393. 1891.

Vuapa discolor (Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Branchlets pilosulose. *Petioles* (2-)5-10 mm. long, pilosulose. *Leaf blades* (3-)4-5(-7)-jugate, the pairs 10-30 mm. apart, the rachis pilosulose. *Leaflets* (1.5-)4-5(-7) cm. long, 1-3.5 cm. wide, the apex retuse, the lower surface granulose-ceriferous, glabrous or rarely puberulous on costa base, the costa impressed above. *Inflorescence* (3-)6(-13.5) cm. long, terminal, the axis puberulous; bracts 4 mm. long, 1.5 mm. wide, lanceolate, puberulous externally on the costa and at the apex, sparsely puberulous within; pedicels 2-5 mm. long, puberulous; bracteoles 8.5-12 mm. long, 3.5-6 mm. wide, more or less elliptic, glabrous within. *Sepals* free or united basally, lanceolate, acute to long-acuminate, the adaxial pair 2.5-3 mm. long, 1-1.5 mm. wide, the others 5-7 mm. long, 1-3 mm. wide. *Petal* blade (3.5-)5.5-7 mm. long, the claw (6.5-)9-12.5 mm. long. *Ovary* pilosulose on the margins, 4-6-ovulate, the gynophore pilosulose, inserted on the adaxial hypanthial wall at or near the apex. *Fruit* unknown.

Type Collection: R. Spruce 3755, "In sylvis humilioribus secus fl. Guainiam," upper Río Negro, Venezuela, Nov. 1854 (HOLOTYPE K).

Additional Specimens: VENEZUELA: Amazonas: Cerro Sipapo, near base camp, above Caño Cuao, Dec. 1948, Maguire & Politi 27978 (GH, IAN, NY, P, RB, U); savanna near Base Camp, Cerro Sipapo, Feb. 1949, Maguire & Politi 28819 (G, NY, US, VEN), 28823 (F, G, IAN, K, MO, NY, US, VEN); Esmeralda Savanna, Alto Orinoco, Sept. 1944, Steyermark 58402 (F, VEN); Esmeralda, Grand Savanna-Sect. 1, Nov. 1928, Tate 289 (NY, US).

15c. *Macrolobium discolor* var. *egranulosum* Cowan, var. nov. Figure 5b.

Arbuscula 2-3 m. alta, ramulis pilosulis. Stipulae 5 mm. longae, subulatae vel subulato-lanceolatae, intus glabrae, extus pilosulae. Petiolus 2-5 mm. longus,

pilosulus. Foliorum lamina 3-5-jugata, paribus 8-21 mm. separatis; rachibus 2.5-4.5 cm. longis, angustissime alatis, pilosulis. Foliola 1.5-4 cm. longa, 0.5-2.5 cm. lata, oblonga vel oblongo-ovalia, in costa supra puberula, infra sparsissime pilosula vel glabra, margine plana; costa plana vel leviter saliens supra, infra valde saliens, venulae prominentes. Inflorescentiae 3-10 cm. longae, axe puberulo; bracteolae 5.5-6.5 mm. longae, 3.5-4 mm. latae, ovaes, glabrae intus, extus puberulae. Hypanthium 1-1.5 mm. longum, puberulum. Sepala adaxilia 2 mm. longa, 1 mm. lata vel nulla, sepala cetera 2-3.5 mm. longa, 1-1.5 mm. lata, glabra vel ad apicem ciliolata. Petali lamina 4.5 mm. longa, 5-6 mm. lata, plus minusve transverse ovalis. Filamenta 18-20.5 mm. longa, sparse villosula ad basim. Stigma subcapitellatum. Stylus 15.5-20 mm. longus, ad basim sparsissime pilosulus. Ovarium 1.5-2 mm. longum, 1 mm. latum, oblongum, marginibus villosis, 2-4-ovulatum, gynophoro 1.5-2 mm. longo, villosulo. Fructus 5 cm. longus, 2.5 cm. latus, oblongus, marginibus sparse pilosulis; semina 1.5 cm. diametro, suborbicularia, testa tenuissime membranacea.

Type Collection: *B. Maguire, R. Cowan & J. Wurdack 30842*, "frequent shrub to 2 m. tall, petal white, filaments red, calyx red, dry open eastern slopes of Cerro Moriche, Río Ventuari, Amazonas, Venezuela," Jan. 1951 (HOLOTYPE NY, isotypes F, G, GH, IAN, K, MO, P, RB, U, UC, US, VEN).

Additional Specimens: VENEZUELA: Sabanita, northwest base of Cerro Moriche, Jan. 1951, *Maguire, Cowan & Wurdack 30977* (BM, COL, NY).

The affinity of this species for *M. multijugum* is unmistakable but *M. discolor* differs by its short peduncles, somewhat differently-shaped epunctate leaflets and the very different shape of the fruit.

The typical variety and var. *caudiculatum* are characterized by the presence of great quantities of granular wax-bodies which are of uniform size and form and are distributed evenly over the lower surface of the leaflets. Although this condition is not peculiar to these taxa, it does serve to distinguish them from the other variety.

Var. *caudiculatum* may be distinguished from the typical variety by its pubescent under surfaces of the leaflets and the more uniform size of the sepals. It is, then, not strikingly distinct and certainly not worthy of the specific rank accorded it by Ducke.

Var. *egranulosum* differs, in addition to the difference noted above, by its smaller bracts and bracteoles, by the villose ovary margins, and by its plane leaflet margin. While the other two varieties are obviously quite closely related, this one is not clearly related to either of the others.

16. *Macrobium multijugum* (DC.) Benth. in Mart. Fl. Bras. 15(2): 222. 1870. Figure 6.

Small to large tree 3-37 m. tall, 2.5-10 dm. diameter, the branchlets glabrous, very rarely minutely puberulous. *Petioles* 1-3.5 cm. long, canaliculate to sulcate, glabrous or very rarely minutely puberulous. *Leaf blades* 3-9-jugate, the pairs 7-28 mm. apart; rachis 3-14.5 cm. long, canaliculate, glabrous or very rarely minutely puberulous. *Leaflets* 2.5-9.5 cm. long, 1-4.5 cm. wide, oblong-oblongate, oblong, oblong-obovate, or narrowly oblong, the base inequilateral, the upper side subcordate to cordate or acute, the lower side acute, the apex usually truncate, sometimes rotund, entire, or broadly retuse to emarginate, minutely apiculate, the margin entire or sinuate, glabrous, or more often pilosulose on the apical-lateral surface of the costa at the junction with the upper side of the leaflet base, punctate beneath; costa impressed above, infrequently plane, strongly salient beneath, the venules prominulous. *Inflorescence* 2.5-14 cm. long, the axis

glabrous or puberulous, the peduncles 10-55 mm. long; bracts 1-2.5 mm. long, 1-1.5 mm. wide, early caducous, triangular, acute, ciliolate but otherwise glabrous, rarely puberulous externally; pedicels 2-5.5 mm. long, glabrous or puberulous; bracteoles 5-8 mm. long, 3-5 mm. wide, elliptic to oblong or ovate-lanceolate, acute, usually glabrous, infrequently ciliolate or apically puberulous, very rarely puberulous internally. *Hypanthium* 1-2 mm. long, glabrous, sessile. *Sepals* five, free or the adaxial pair more or less united, 2.5-6 mm. long, 0.5-2 mm. wide, oblong or linear to lanceolate, usually acuminate or caudate-acuminate, sometimes acute, glabrous or sparsely ciliolate apically. *Petal* blade 3-7 mm. long, 3.5-8.5 mm. wide, transversely oval, the claw 3.5-6.5 mm. long, auriculate, glabrous or sparingly pilosulose at the base externally, more or less villosulose within, the auricles sometimes ciliolate. *Filaments* 11-21 mm. long, somewhat villosulose basally. *Stigma* simple or capitellate. *Style* 13.0-22.5 mm. long, glabrous or rarely puberulous basally. *Ovary* 1.5-3.5 mm. long, 1-2.5 mm. wide, usually oval, less frequently oblong, oval-oblong or suborbicular, 1(-2)-ovulate, glabrous or infrequently puberulous to pilosulose on the margins; gynophore 2-3.5 mm. long, glabrous or infrequently puberulous to pilosulose, inserted on the hypanthium base. *Fruit* 3-7.5 cm. long, 3-5.5 cm. wide, oval to suborbicular, the adaxial margin contracted into a narrow wing-like ridge, glabrous, the carpophores 2-7 mm. long, glabrous or puberulous. *Seeds* 2 cm. long, 1.5-2.5 cm. wide, oval to suborbicular, the testa thin-crustose, brown, venose.

Key to the Varieties of *Macrolobium multijugum*

1. Leaflets entire, usually broadly oblong to oblong-obovate. 16a. var. *multijugum*.
 1. Leaflets sinuate, narrowly oblong. 16b. var. *sinuatum*.

16a. *Macrolobium multijugum* var. *multijugum*. Figure 6.

Outea multijuga DC. Prodr. 2: 510. 1825.

Vouapa multijuga (DC.) Taub. Bot. Centralbl. 47: 393. 1891.

Vuapa multijuga (DC.) Kuntze, Rev. Gen. 1: 213. 1891.

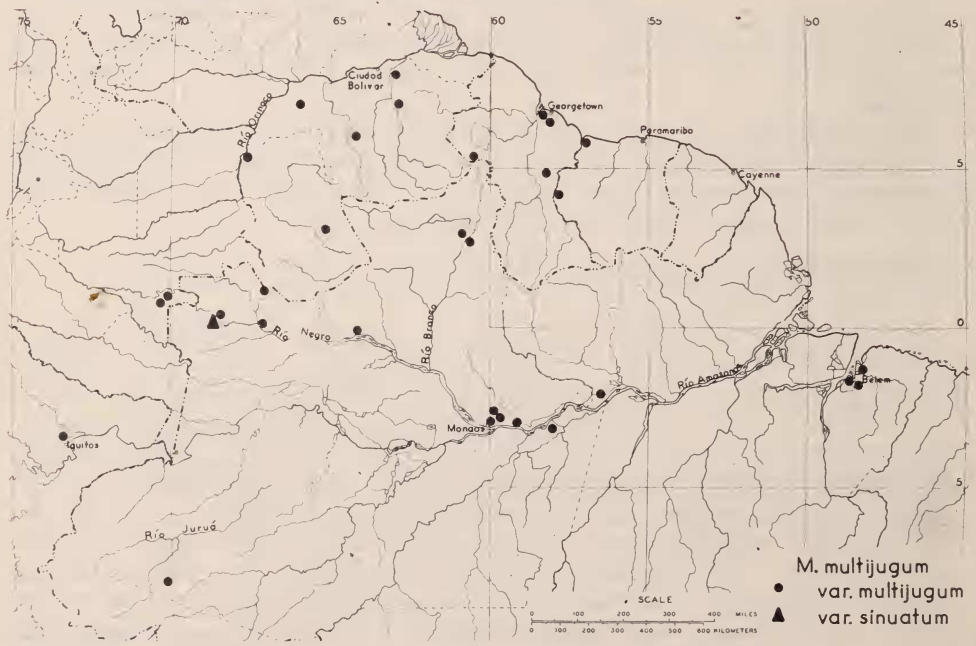


FIG. 6. Geographic distribution of *M. multijugum*.

Leaves about 6-jugate, the pairs usually about 18 mm. apart. *Leaflets* averaging 6-7 cm. long, 2-3 cm. wide, oblong, oblong-oblongeolate, or oblong-obovate, the margin entire. *Inflorescence* usually about 4-8 cm. long, the peduncle averaging 15-25 mm. long; pedicels about 4 mm. long; bracteoles about 6 mm. long, 4 mm. wide, elliptic to oblong. *Sepals* most often 4 mm. long, 1 mm. wide. *Petal* blade generally 4-5 mm. long, 5-6 mm. wide, the claw about 5 mm. long. *Filaments* about 16 mm. long.

Type Collection: *J. Martin s.n.*, "Cayenne" (HOLOTYPE G, isotypes K, P, VEN-frag.). A letter from Dr. Hochreutiner, then at Geneva, to Dr. Pittier, who was at the National Herbarium of Venezuela, was found attached to one of the specimens of this species from the latter institution. In it Dr. Hochreutiner explained that the holotype of this species is a sterile branch and enclosed a photograph and two leaflets of it. The isotype from the Kew Herbarium is fruiting, the Paris isotype is flowering and both are certainly just as valuable as the holotype, although the species is recognizable from most of the other species even vegetatively.

Additional Specimens: BRAZIL: Rio de Janeiro, *Glaziou 13759* (P). Pará: Pará, Sept. 1947, *Black 47-1751* (IAN, NY, U); Lago de Faro, July 1903, *Ducke 3727* (G); Lago de Faro, Aug. 1907, *Ducke 8339* (G); Lago de Faro, May 1911, *Ducke 11694* (G); Rio Tapajóz, near Bobure Falls, July 1923, *Ducke 16944* (U); Belém, May 1896, *Huber 122* (G, US); Thomé Assú, Rio Acara, Dist. Acara, Aug. 1931, *Mexia 6027* (F, G, GH, MO, NY, U, UC, US); Belém, June 1951, *Pires 3300* (IAN, NY); Rio Pará, May 1832, *Poeppig 2998* (F, G, P, US); Rio Tapajóz, Santarém, *Spruce 638* (P); Santarém, June 1850, *Spruce 935* (P); vic. Santarém, June 1850, *Spruce s.n.* (G, NY, W). Amazonas: Igarapé do Cachoeira Grande, Manãos, Aug. 1940, *Ducke 347* and *347a* (Y); Barba, Rio Madeira, April 1937, *Ducke 478* (A, F, MO, NY, US); Igarapé do Cachoeira Grande, Manãos, Jan. 1941, *Ducke 576* (F, IAN, MO, NY, US); Cucuhy, ad Rio Negro, Sept. 1935, *Ducke 35189* (G, RB, U, US); Rio Negro, Padauri, Uacuacu, Oct. 1947, *Froes 22490* (IAN, NY, U); Rio Padauri, Igarapé Castanha, Oct. 1947, *Froes 22558* (IAN, NY); Rio Urubú, Sept. 1949, *Froes 25224* (IAN, RB), *25278* (IAN, NY); Rio Urubú, São Francisco, Oct. 1949, *Froes 25490*, *25507* (IAN, NY); near mouth of Rio Embira, tributary of Rio Tarauca, July 1933, *Krukoff 5186* (A, F, G, MO, NY, U, UC, US); Boa Vista, Rio Branco, Sept. 1913, *Kuhlman 3236* (U, US); Maues, Nov. 1946, *Pires 43* (IAN, NY); prope San Gabriel do Cachoeira ad Rio Negro, Jan.-Aug. 1852, *Spruce 2258* (G, GH, P); prope Panure ad Rio-Uaupés, Oct.-Jan. 1852-53, *Spruce 2439* (G, GH, P, W); igapo near Rio Tarumá, Rio Negro, July 1874, *Traill 183* (P); bei Boa Vista, Rio Branco, Oct. 1908, *Ule 7581* (G, UC, US); Rio Branco, near Boa Vista, Oct. 1908, *Ule 7612* (G); Cachoeira Grande bei Manãos, July 1910, *Ule 8866* (G, UC).

PERU: Iquitos on shore of Itaya, July 1924, *Tessmann 3677* (G, NY).

COLOMBIA: Vaupes, Rio Cuduyari, Aug. 1944, *Allen 3300* (US); Mita, Rio Vaupés, Sept. 1939, *Arbelaes & Cuatrecasas 6746* (COL, F, US).

VENEZUELA: Rio Orinoco, *Bonpland 1028* (P). Amazonas: Esmeralda, alto Orinoco, May 1942, *Williams 15462* (F, NY, US, VEN); Cataniapo, Raudal de Atures, May 1942, *Williams 15898* (US, VEN). Bolivar: Rio Tono, alto Rio Paragua, Aug. 1943, *Cardona 817* (NY, US, VEN); Rio Paragua, Dec. 1951, *Maguire 32713* (F, G, K, MO, NY, US, VEN); Sabana de Monte Oscuro, Bajo Coura, May 1939, *Williams 12057* (F, VEN); La Paragua, March 1940, *Williams 12594* (F, UC, US, VEN); El Tigre, cerca del Rio Cuchivero, June 1940, *Williams 13309* (F, UC, US, VEN).

BRITISH GUIANA: Berbice, right bank of Berbice R., opposite to Yawakuri R., June 1919, *Hohenkerk (F.D.No.) 798* (BGF); Lama Creek, April 1887, *Jenman 3695* (BM, NY); Lama Creek, May 1896, *Joseph s. n.* (NY); Roraima 1842-43, *Schomburgk 460 & 461* (P, W); Rio Branco, Sept. 1842, *Schomburgk 736* (P, W); Rio Branco, *Schomburgk 797* (F, G, GH, P, US, W); *Schomburgk 894* (W).

SURINAM: Boven Nickerie, Feb. 1915, *Gonggrypp & Stabel (For. Bur. No.) 1085* (U); Corantyne R., Kaboerie Creek, June 1916, *Herb. Surinam 2217* (IAN, U, US); Maratoka, Nov. 1917, *Herb. Surinam 3423* (U); Surinam, *Hostmann 76* (F, NY, P, W); Surinam, *Hostmann 686a* (MO, P, U, W); Surinam 1842, *Hostmann & Kappler 664* (F, G, MO, P, US, W); Para R., March 1838, *Splitgerber s. n.* (W); Akwansa-Nickerie, Sept. 1916, *Stabel & Gonggrypp 3594* (U); *Wullschlagel 959* (W).

FRENCH GUIANA: *Martin 7* (P); *Poiteau s. n.* (P); Acarouany, 1858, *Sagot 184* (P, W); Maroni, on sea coast, June 1857, *Sagot 1062* (P, W); Acarouany, May 1855, *Sagot s. n.* (P).

Vernacular Names: Venezuela: "arepillo", "arepito"; Brazil: "arapari", "arapary-rana", "paricazeiro"; Surinam: "aratapari" (Kar.).

16b. *Macrolobium multijugum* var. *sinuatum* Cowan, var. nov. Figure 6.

Petiolus 2-3.5 cm. longus, canaliculatus, glaber. Foliorum lamina 5-6-jugata, paribus 1.5-2.5 cm. separatis; rachibus 7-8 cm. longis, glabris. Foliola 4.5-8.5 cm. longa, 1-2.5 cm. lata, anguste oblonga, margine sinuato, ad basim inaequalia sed ambobus lateribus acutis, ad apicem obtusa, apiculata, glabra. Inflorescentiae 5-9 cm. longae, axe glabro, pedunculo 1-3 cm. longo; pedicellis 2-4.5 mm. longis, glabris; bracteolo 7 mm. longo, 4 mm. lato, ovato-lanceolato, glabro. Sepala 3-4 mm. longa, 0.5-1.5 mm. lata, lanceolata, glabra. Filamenta 15 mm. longa. Stigma paulo incrassatum. Ovarium 2-2.5 mm. longum, 1.5-2 mm. latum, ovale vel ovatum, glabrum. Fructus ignotus.

Type Collection: R. Spruce 2440, "prope Panure ad Rio Uaupés," Brazil, Oct.-Jan. 1852-53 (HOLOTYPE GH, isotypes BM, G, K, NY, P, W).

On one of the isotypes at Kew, Spruce notes, "... the lvs being rendered narrower & their margins wavy by the puncture of insects in the bud." However, I have failed to find any suggestion of damage to any part of the specimens examined and I believe that these differences are natural, not due to insect injury as Spruce supposed.

This species is so variable in most of its characters that it is very difficult to enumerate a number of characters which will infallibly separate it from other related species. However, the punctuation of the lower leaflet surface and the elongate peduncles of this species are characteristics which reliably distinguish it.

Macrolobium multijugum is rather closely related to *M. molle* and to *M. discolor*. It may be separated from the first of these by its glabrous or nearly glabrous leaflets and glabrous or minutely puberulous inflorescence axis. From *M. discolor* it is distinct by its glandular punctations on the lower leaflet surfaces, its elongate peduncles, and its very different fruit shape.

The two varieties involved differ only by the shape and margin of their leaflets. Whereas the margins of the broadly oblong to oblong-obovate leaflets of the typical variety are entire, the margins of the narrowly oblong ones of the other variety are distinctly sinuate.

17. *Macrolobium microcalyx* Ducke, Bull. Mus. Hist. Nat. Paris II. 4: 729. 1932. Figure 7.

Sbrub of 2 m. to tree 10 m. tall, the branchlets microscopically puberulous or occasionally glabrous. *Petioles* 2-6 mm. long, glabrous or puberulous on the upper surface, canaliculate. *Leaf blades* 3-5-jugate, the pairs 8-25 mm. apart; rachis 3-9 cm. long, glabrous or the axis minutely uncinat-puberulous on the upper surface. *Leaflets* 15-45 mm. long, 7-25 mm. wide, oval to oblong to oblong-obovate, the base inequilateral, the upper side cordate, the lower side acute to subobtuse, the apex rotund, retuse to emarginate, sometimes apiculate; upper surfaces minutely uncinat- or arcuate-puberulous on the costa, glabrous beneath; costa salient above, plane to subsalient beneath, the venules prominulous. *Inflorescence* 2-9 cm. long, the axis minutely puberulous, the peduncle 2-6 mm. long; bracts 1.5-2 mm. long, 1-1.5 mm. wide, caducous, triangular to triangular-ovate, acute, ciliate, glabrous within, very minutely puberulous externally or rarely glabrous outside; pedicels 1-3.5 mm. long, very minutely puberulous; bracteoles 4.5-7 mm. long, 2-3 mm. wide, oblong to oblong-oval to oblong-obovate, villosulose within, appressed-puberulous externally. *Hypanthium* 1-1.5 mm. long, sparsely puberulous, sessile. *Sepals* five, free, the adaxial ones 0.5-1.5 mm. long, 0.5-1 mm. wide, triangular, acute to acuminate, glabrous, the other sepals 1.5-3 mm. long, 1-1.5 mm.

wide, triangular-lanceolate to lanceolate, acuminate to caudate-acuminate, glabrous. *Petal* blade 2.5-5.5(-7) mm. long, 4-5 mm. wide, transversely oval, the claw 2-4 mm. long, auriculate or merely expanded at the base, more or less pilosulose on the outer surface or rarely glabrous, villosulose within, sometimes sparsely so, claw ciliolate. *Filaments* (10-)16-18 mm. long, villosulose in the lower part. *Stigma* capitellate. *Style* (8.5-)11-16.5 mm. long, villose basally. *Ovary* 1.5-2 mm. long, 1 mm. wide, oblong, 2-ovulate, villose on all surfaces, the gynophore 1.5-2.5 mm. long, villosulose, inserted on the base or up to midway on the adaxial hypanthial wall. *Fruit* unknown.

LECTOTYPE: A. Ducke (H.J.B.R. No.) 23298, "Estrada do Aleixo, Manáos," Amazonas, Brazil, Sept. 1929 (deposited RB, isolectotypes G, P, U, US).

Additional Specimens: BRAZIL: Amazonas: Camanaos, Sept. 1935, Ducke 34 (A, F, IAN, MO, NY, US); Camanaos, upper Rio Negro, Nov. 1929, Ducke (H.J.B.R. No.) 23299 (US).

PERU: Mishuyacu, near Iquitos, Dept. Loreto, 1929-30, Klug 140, 387, 1043 (NY, US).

The nearest relative of *M. microcalyx* is *M. montanum*, especially the typical variety of the latter. The following characters of *M. microcalyx* serve to distinguish it from its nearest relative: (1) its sepals are strongly dimorphic in both size and shape; (2) the ovary is villose on all surfaces; and (3) it usually has more pairs of leaflets per leaf.

18. *Macrolobium montanum* Ducke, Arch. Bot. Jard. Rio de Janeiro 4: 49. 1925.

Figure 7.

Small shrub 1-1.5 m. tall or small tree 10-13 m. tall, the branchlets glabrous, or minutely puberulous but then glabrescent. *Petioles* 7-13 mm. long, glabrous. *Leaf blades* 2-3-jugate, the pairs 7-17 mm. apart; rachis 8-32 mm. long, glabrous. *Leaflets* 17-32 mm. long, 10-25 mm. wide, oval to suborbicular or oblong to obovate, the base inequilateral, the upper side cordate, the lower rotund-obtuse or acute, the apex rotund, retuse to emarginate; glabrous, or very sparsely puberul-

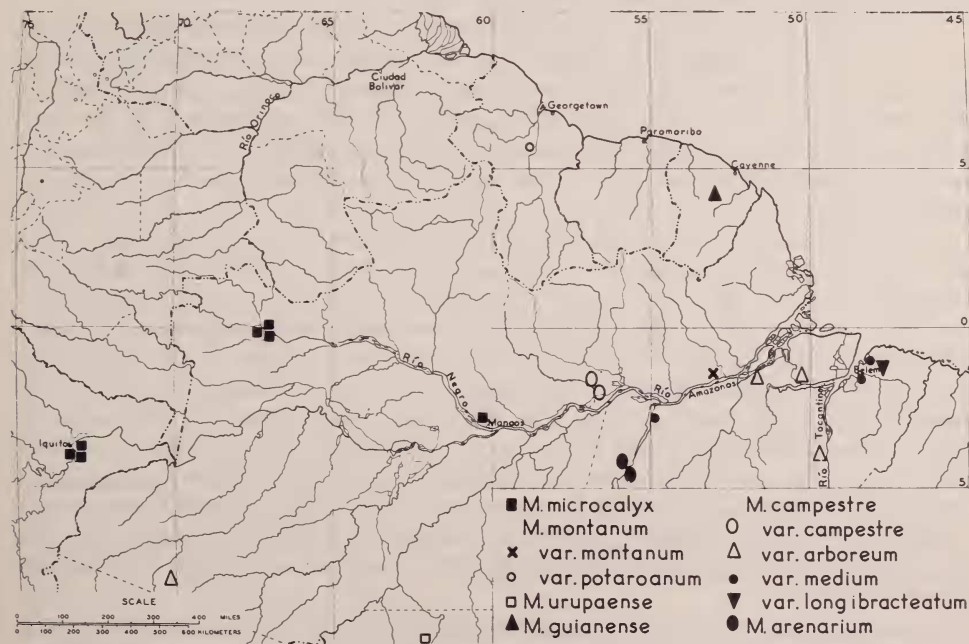


FIG. 7. Geographic distribution of *M. microcalyx*, *M. montanum*, *M. urupaense*, *M. guianense*, *M. campestre*, and *M. arenarium*.

lous on the costa above; costa salient, plane or slightly impressed on the upper surface, salient beneath, the venules obscure on the upper surface, prominulous beneath. *Inflorescence* 4-9 cm. long, the axis minutely puberulous, the peduncle 1.5-9 mm. long; bracts 1-1.5 mm. long, 1-1.5 mm. wide, triangular, glabrous within, glabrous or pilosulose externally; pedicels 4-7 mm. long, minutely puberulous or glabrous; bracteoles 5.5-8 mm. long, 3-3.5 mm. wide, elliptic, pilosulose within, minutely puberulous or glabrous outside. *Hypanthium* 1.5-2 mm. long, glabrous, subsessile. *Sepals* five, 2.5-3.5 mm. long, 1-1.5 mm. wide, the adaxial pair nearly completely united, triangular-lanceolate, acute, the other sepals oblong-lanceolate, lanceolate or elliptic, bluntly acute to acuminate, ciliolate apically. *Petal* blade 3-4 mm. long, 4-5 mm. wide, more or less transversely oval, the claw 2.5-6 mm. long, auriculate, ciliolate basally, glabrous externally, villosulose within. *Filaments* 11-21 mm. long, villosulose basally or glabrous. *Stigma* simple or capitellate. *Style* 8.5-10.5 mm. long, glabrous. *Ovary* 2-2.5 mm. long, 1 mm. wide, oblong or linear, glabrous, 2-4-ovulate; gynophore 1.5-3.5 mm. long, puberulous or glabrous, inserted at the top of the adaxial hypanthial wall. *Fruit* 5.5-10 cm. long, 2.5-3 cm. wide, oblong-oblongeolate, glabrous, the carpophores 8-14 mm. long, glabrous. *Seed* 1-3 per fruit, about 1.5 cm. in diameter, suborbicular, the testa membranous, reddish-brown, smooth.

Key to the Varieties of *Macrobium montanum*

1. Small shrub with glabrous branchlets; leaflets oval to suborbicular, leaf rachis 8-18 mm. long; bracteoles 6-6.5 mm. long, minutely puberulous on outer surface; filaments villosulose basally. Lower Amazon River region. 18a. var. *montanum*.
1. Tree 10-12 m. tall, young branchlets minutely puberulous, glabrescent; leaflets oblong, oblong-obovate, or obovate; leaf rachis (15-)25-32 mm. long; bracteoles 8 mm. long, glabrous on outer surface; filaments glabrous. Potaro River region of British Guiana. 18b. var. *potaroanum*.

18a. *Macrobium montanum* var. *montanum*. Figure 7.

Small shrub 1-1.5 m. tall, the branchlets glabrous. *Leaf blades* with the leaflet pairs 7-11 mm. apart, the rachis 8-20 mm. long. *Leaflets* glabrous, oval to suborbicular, the lower side of the base rotund-obtuse. *Pedicels* minutely puberulous; bracteoles 5.5-6.5 mm. long, 3 mm. wide, minutely puberulous on the outer surface. *Filaments* basally villosulose. *Stigma* capitellate. *Gynophore* 1.5-2.5 mm. long, puberulous. *Fruit* 5.5-6.5 cm. long, the carpophores 8-10 mm. long, the seeds one per fruit.

LECTOTYPE: A. Ducke (H.J.B.R. No.) 16947 (flowering portion), "Serra Pontada regione, Jutahy de Almeirim," Pará, Brazil, April 1923 (deposited NY, islectotypes IAN, P, RB, U-in part, US-in part). A lectotype designation is obligatory here, because the single collection number cited in the original description consisted of two collections, one flowering and the other fruiting. The sheets at U and at US have parts of both collections mounted on the same sheet, hence the unusual manner of citation above. The NY sheet was selected as the lectotype because the label is in Ducke's hand, it bears only flowering material, and the locality data are exact. The flowering specimen on the US sheet is in even better condition, but it is accompanied by a portion of the fruiting material and the collection number on this sheet involves a transposition of the numerals. The RB material is of the flowering collection but its condition is inferior to either the NY or US sheets.

Additional Specimens: BRAZIL: Serra Pontada region, inter Almeirim et Prainha, Pará, Sept. 1923, Ducke (H.J.B.R. No.) 16947-A (fruiting portion) (F-frag., U-in part, US-in part). This collection is being cited as an "A"-number to distinguish between the two collections which were assigned the same number.

18b. *Macrolobium montanum* var. *potaroanum* Cowan, var. nov. Figure 7.

Arbor 10-13 m. alta, 1 dm. diametro, ramulis minute puberulis, glabrescentibus. Petiolus 8-11 mm. longus, glaber. Folia 2-3-jugata, paribus 10-17 mm. separatis; rachibus 15-32 mm. longis, glabris. Foliola 20-35 mm. longa, 10-20 mm. lata, oblonga, obovata vel oblongo-obovata, ad basim inaequalia, basis superiore latere cordato, inferiore acuto, ad apicem rotundata vel truncata, retusa, supra glabra vel sparsissime puberula in costa, infra glabra; costa saliens ambobus lateribus. Inflorescentiae 8 cm. longae, axe minutissime puberulo, pedunculo 1.5 mm. longo; bracteis 1.5 mm. longis, 1 mm. latis, triangularibus, ciliolatis sed aliter glabris; pedicellus 4-5 mm. longus, glaber; bracteolae 8 mm. longae, 3.5 mm. latae, ellipticae, acuminatae, intus sparse pilosulae, extus glabrae. Hypanthium 2 mm. longum, stipite 0.5 mm. longo, glabrum. Sepala 3-3.5 mm. longa, 1-1.5 mm. lata, lanceolata vel elliptica, acuta ad acuminata. Petali lamina 4 mm. longa, 5 mm. lata, transverse ovale, unguiculus 5 mm. longus, auriculatus. Filamenta 21 mm. longa, glabra. Stigma simplex. Stylus 10.5 mm. longus, glaber. Ovarium 2 mm. longum, 1 mm. latum, lineare, glabrum, 2-ovulatum, gynophoro 3.5 mm. longo, glabro. Fructus immaturus 10 cm. longus, 2.5 cm. latus, oblongus, apicem versus latior, glaber, carpophoro 12-14 mm. longo, glabro, 1-3-seminifer.

Type Collection: *D. B. Fanshawe* 764 (*F.D. No. 3500*), "83 miles Bartica-Potaro Road," British Guiana, July 1942 (HOLOTYPE BGF).

Additional Specimens: BRITISH GUIANA: 85 miles Bartica-Potaro Road, Nov. 1947, *Fanshawe* 2758 (*F.D. No. 5557*) (BGF, U).

The diagnostic characters of this species clearly indicate its affinity with *M. microcalyx* and *M. urupaense*. It differs from the first of these by its less strongly dimorphic sepals, by its glabrous ovary, and its usually greater number of leaflets per leaf. From *M. urupaense* it may be separated by its fewer leaflet pairs, by its more or less pubescent bracteoles, and by its generally shorter, glabrous or basally villosulose filaments.

The two varieties included in this species are separable by the shape of their leaflets, length of their leaf rachises, size of their bracteoles, presence or absence of pubescence on the filaments, and by their geographic distribution.

19. *Macrolobium urupaense* Hoehne, *Comm. Linh. Teleg. Estrat Matto-Grosso*, Anexo n. 5, Bot. pt. 12: 11. pl. 184. 1922. Figure 7.

Shrub or small tree, the branchlets, leaves, and inflorescence glabrous. *Petioles* 8-10 mm. long, canaliculate. *Leaf blades* 5-7-jugate, the pairs about 12 mm. apart; rachis 5-8 cm. long, canaliculate-alate. *Leaflets* 15-45 mm. long, 10-20 mm. wide, oblong or oval-oblong, the base inequilateral, the upper side cordate, the lower side obtuse, the apex rotund, emarginate; costa plane on the upper surface, salient beneath, the venules obscure above, prominulous beneath. *Inflorescence* 5-6 cm. long (fide Hoehne); pedicels 5 mm. long (5-7 mm. fide Hoehne); bracteoles 10 mm. long, 5 mm. wide, broadly elliptic, acute, glabrous. *Hypanthium* 1.5 mm. long, glabrous. *Sepals* five, the adaxial pair nearly completely united, 2.5 mm. long, 1.5 mm. wide, triangular, acute, the other sepals 5 mm. long, 2-2.5 mm. wide, lanceolate, acute. *Petal* blade about 5 mm. long, 6 mm. wide, transversely oval, the claw 5 mm. long, strongly auriculate. *Filaments* 25 mm. long (30-35 mm. fide Hoehne), villose in the lower one-half or more. *Style* glabrous. *Ovary* 2.5 mm. long (1.5 mm. fide Hoehne), 1 mm. wide, oblong, glabrous, 4-ovulate (3-ovulate fide Hoehne), the gynophore 5 mm. long, puberulous, inserted at the top of the adaxial hypanthial wall. *Fruit* unknown.

Type Collection: *J. G. Kublmann* 2029 (*H.J.B.R. No. 7323*), "Campos dos Urupás, Rondonia, Cataqui-Iamain, noroeste de Matto Grosso," Brazil, Dec. 1918 (RB).

This very poorly known species exhibits characters which ally it with *M. montanum* and *M. microcalyx*, the former being much the nearer relative of the two. *M. urupaense* shares with *M. montanum* the glabrous ovary character, but they may be differentiated by the larger number of leaflet pairs, glabrous bracteoles, and longer villose filaments of *M. urupaense*. From *M. microcalyx* this species may be readily recognized by its glabrous ovary and inflorescence.

20. *Macrolobium guianense* (Aubl.) Pulle, Enum. Vasc. Pl. Surinam 211. 1906.

Figure 10.

Outea guianensis Aubl. Pl. Guian. 1: 29. pl. 9. 1775.

Macrolobium Utea Gmelin, Syst. Nat. ed. 13. 2(1): 93. 1796.

Macrolobium pinnatum Willd. Sp. Pl. 186. 1797.

Utea guyannensis (Aubl.) J. St.-Hil. Expos. Fam. 2: 203. 1805.

Macrolobium Outea Steud. Nom. Bot. 1: 503. 1821.

Vouapa guyanensis (Aubl.) Taub. Bot. Centralbl. 47: 394. 1891.

Vuapa guianensis (Aubl.) Kuntze, Rev. Gen. 1: 213. 1891.

Tall tree, to 5 m. diameter (fide Aublet), the branchlets pilosulose and puberulous. *Stipules* 6-7.5 mm. long, 0.5-1 mm. wide, linear, acuminate, persistent, ciliate, glabrous within, pilosulose outside. *Petioles* 3-6 mm. long, canaliculate, pilosulose. *Leaf blades* 2-jugate, the pairs of leaflets 13-17 mm. apart; rachis 13-17 mm. long, pilosulose on the upper surface, the axis pilosulose beneath. *Leaflets* 27-56 mm. long, 15-26 mm. wide, oval to elliptic, the base inequilateral, the upper side subcordate to cordate, the lower side acute, the apex obtuse, re-use, minutely apiculate; upper surface more or less uncinately-puberulous on the costa, sparsely to sparingly pilosulose on the basal one-half or less of the costa beneath; costa salient, the venules prominent. *Inflorescence* 5-7.5 cm. long, the axis except the peduncle glabrous, the peduncle 12-13 mm. long, puberulous; bracts somewhat persistent, 7-7.5 mm. long, 1-1.5 mm. wide, lanceolate to linear, acuminate, ciliate, otherwise glabrous; pedicels 4.5-8 mm. long, puberulous in two lines which coincide with the separation lines of the bracteoles; bracteoles 7.5-9 mm. long, 3.5 mm. wide, elliptic, apiculate, glabrous. *Hypanthium* 2 mm. long, sessile. *Sepals* five, the adaxial pair partly united; 2.5-3.5 mm. long, 1-1.5 mm. wide, the other sepals 4.5-6.5 mm. long, 1-2 mm. wide, lanceolate, glabrous, bluntly acute or obtuse. *Petal* blade about 6 mm. in diameter, orbicular, the claw 4.5 mm. long, weakly villosulose on the claw and up into the throat of the blade within, glabrous externally. *Filaments* about 20 mm. long, the lower part villosulose. *Style* glabrous. *Ovary* 2.5-4.5 mm. long, 1-1.5 mm. wide, oblong, sparsely pilosulose on one or both margins, the lateral surfaces glabrous, 4-ovulate; gynophore 2.5-4.5 mm. long, pilosulose, inserted in the hypanthium near the apex of the adaxial wall. *Fruit* unknown.

Type Collection: *F. Aublet s.n.*, Guiana (isotype BM).

Additional Specimens: SURINAM: *Hostmann & Kappler 254* (F, K, P, U, US, W). This collection has been variously cited as "Hostmann s.n.," "Hostmann 254," and as it is cited here, but all are undoubtedly parts of the same collection.

The nearest relative of *M. guianense* is probably *M. montanum* or *M. urupaense*, but the relationship to either is rather remote. It is easily recognizable from both of its presumed relatives by its oval or elliptic leaflets which are always in two pairs and by its persistent stipules.

21. *Macrolobium campestre* Huber, Bol. Mus. Goeldi 5: 389. 1909. Figure 7.

Shrub to large tree 35 m. tall, the branchlets and leaves glabrous, very rarely the branchlets sparsely puberulous or pilosulose. *Petioles* 5-30 mm. long, terete or weakly sulcate to subcanaliculate. *Leaf blades* 2-3-jugate, sometimes one leaflet of the terminal pair absent and then the leaf pseudo-imparipinnate, the pairs

9-30 mm. apart; rachis 10-60 mm. long, slightly canaliculate or terete on the upper surface, not at all alate. *Petiolules* 2-6 mm. long. *Leaflets* 4-12 cm. long, 2-6 cm. wide, the base inequilateral, acute to subcordate, the apex bluntly acute to long-acuminate; costa impressed on the upper surface, salient beneath, the venules prominulous. *Inflorescence* 4-28 cm. long, rather densely flowered, the axis pilose to puberulous, the peduncle 0-4 mm. long; bracts 5.5-12.5 mm. long, 1.5-4 mm. wide, lanceolate or elliptic, acuminate, pilose to puberulous; pedicels 2.5-4.5 mm. long, pilose to puberulous; bracteoles 5.5-8.5 mm. long, 3-3.5 mm. wide, oblong to elliptic, pilose to puberulous on the outer surface, pilosulose or glabrous within. *Hypanthium* 1-2 mm. long, glabrous to puberulous sparingly. *Sepals* five, the adaxial pair more or less united, 1.5-4 mm. long, 0.5-1.5 mm. wide, oblong to lanceolate or infrequently triangular, the other sepals 2-5 mm. long, 1-2 mm. wide, oblong or linear to elliptic or lanceolate, acute to obtuse. *Petal* blade 3.5-5.5 mm. long, 5-8 mm. wide, the claw 4-7 mm. long, more or less auriculate, glabrous or pilosulose externally, ciliolate basally, villosulose within, sometimes sparsely so and rarely glabrous. *Filaments* 17-22.5 mm. long, villosulose in the lower part. *Stigma* capitellate or capitate. *Style* 12.5-17 mm. long, glabrous or rarely sparsely puberulous basally. *Ovary* 2-3.5 mm. long, 1-1.5 mm. wide, oblong, glabrous or sparsely and minutely puberulous on the margins, 2-4-ovulate; gynophore 1.5-5 mm. long, subglabrous to pilosulose or puberulous, usually inserted near the apex of the adaxial hypanthial wall, but occasionally basal or midway on the wall. *Mature fruit* unknown.

Key to the Varieties of *Macrobium campestre*

1. Leaves always paripinnate, leaflets broadly ovate or elliptic, two-thirds or less as long as wide; bracts densely pilose; shrub of campinas. 21c. var. *campestre*.
1. Leaves paripinnate or pseudo-imparipinnate, leaflets elliptic, lanceolate, or ovate, twice or more as long as wide; bracts pilosulose; tree of lowland forests. 2.
2. Inflorescence 16-28 cm. long; bracteoles glabrous or subglabrous on inner surface; leaves paripinnate. 4.
2. Inflorescence 4-12 cm. long; bracteoles strongly pubescent on inner surface; leaves pseudo-imparipinnate and paripinnate. 3.
3. Bracts 9 mm. long, lanceolate; leaflets mostly about 2-2.5 cm. wide; large tree (to 35 m.). 21a. var. *arboresum*.
3. Bracts 5.5-7 mm. long, elliptic or lanceolate-elliptic; leaflets mostly about 3.5-5 cm. wide; mediocre tree (to 20 m.). 21b. var. *medium*.
4. Branchlets puberulous; leaflets 4-6.5 cm. long, oval to elliptic, abruptly acute; inflorescence 25-28 cm. long, bracts 8 mm. long. 21d. var. *arirambense*.
4. Branchlets glabrous; leaflets 6-11.5 cm. long, ovate to lanceolate, acuminate; inflorescence 16-18.5 cm. long, bracts 10-12.5 mm. long. 21e. var. *longibracteatum*.

21a. *Macrobium campestre* var. *arboresum* Cowan, var. nov. Figure 7.

Arbor ad 35 m. alta, ramulis, petiolis, rachibus, petiolulisque glabris vel raro pilosulis sed glabrescentibus. Petiolus 5-23 mm. longus, teres. Folia 2-3-jugata, pari- vel pseudo-imparipinnata; rachibus (10-)20-45 mm. longa, leviter sulcatis. Petiolulus 2-4 mm. longus. Foliola 40-80 mm. longa, 20-35 mm. lata, ovata, lanceolata vel elliptica, ad basim plerumque obtusa, interdum acuta, ad apicem acuminata, raro acuta. Inflorescentiae 5.5-12 cm. longae, axe pilosulo; bracteis 9 mm. longis, 3 mm. latis, lanceolatis, acuminatis, ambobus lateribus puberulis; bracteolis 6-7 mm. longis, 3.5 mm. latis, ellipticis, pilosulis. Hypanthium glabrum. Petali lamina 3.5-5 mm. longa, 6 mm. lata, transverse ovalis, unguicilo 4.5 mm. longo. Ovarium glabrum, 2-ovulatum, gynophoro 3.5 mm. longo, puberulo. Fructus immaturus 12-13 cm. longus, 4 cm. latus, oblongus, apicem versus latior, glaber, carpophoro 6-13 mm. longo, puberulo.

Type Collection: A. Ducke 16532, "campinas sublonnens, Gurupa," Pará, Brazil, Sept. 1916 (HOLOTYPE US, isotypes G, P).

Additional Specimens: BRAZIL: campina d'Arumatéua, Rio Tocantins, Pará, July 1916, Ducke 16261 (US); in insulis Breves aestuarii amazonica prope flumen Macujurbimzinho, Nov. 1922, Ducke 16943 (U); near mouth of Rio Embira, Amazonas, June 1933, Krukoff 4953 (A, F, G, MO, NY, U, UC, US).

21b. *Macrolobium campestre* var. *medium* Cowan, var. nov. Figure 7.

Arbor media, ad 20 m. alta, 30 cm. diametro, ramulis glabris vel raro sparse puberulis. Petiolus 7-25 mm. longus. Folia 2-3-jugata, paripinnata et pseudo-imparipinnata; rachibus 20-60 mm. longis, teretibus ad subcanaliculatis. Petiolulis 3-6 mm. longis. Foliola 4.5-12 cm. longa, 2.5-5.5 cm. lata, ovata, lanceolata, vel elliptica, ad basim acuta vel obtusa, ad apicem acuta ad acuminata. Inflorescentiae 4-9 cm. longae, axe puberulo; bracteis 5.5-7 mm. longis, 1.5-2.5 mm. latis, ellipticis vel lanceolato-ellipticis, puberulis. Hypanthium glabrum. Petali lamina 4-5.5 mm. longa, 5-8 mm. lata, unguicilo 5.5-7 mm. longo. Ovarium glabrum vel margine sparsissime et minutissime puberulum, 3-4-ovulatum, gynophoro 3.5-4 mm. longo, sparse puberulo.

Type Collection: A. Ducke (H.J.B.R. No.) 10926-A, "Belém do Pará," Brazil, April 1926 (HOLOTYPE US, isotype U).

Additional Specimens: BRAZIL: Pará: Aderson Camp near Tavio, Boa Vista, Rio Tapajóz, April 1932, da Costa 325 (F,G); Tapana, Belém, June 1918, Ducke (H.A.M.P. No.) 17036 (H.J.B.R. No. 10926) (G, RB, U, US).

Vernacular Names: Brazil: "igarana xixy," "igarana vermelha."

21c. *Macrolobium campestre* var. *campestre*. Figure 7.

Shrub with glabrous branchlets. Petioles 8-12 mm. long. Leaf blades 2-jugate, paripinnate, the pairs 20-25 mm. apart; rachis 15-25 mm. long, slightly sulcate. Petiolules 3-5 mm. long. Leaflets ovate to broadly elliptic, the base rotund-obtuse to subcordate, the apex bluntly acute. Inflorescences branched from the base, rarely lateral branchlets above the base, (6-)12-14 cm. long, the axis densely pilose to pilosulose, sessile; bracts 8-9 mm. long, 3.5-4 mm. wide, flexuose-pilose on both surfaces, more densely so externally. Hypanthium sparingly puberulous. Petal blade 4.5-5 mm. long, 7-7.5 mm. wide, oval transversely, the claw about 4 mm. long. Ovary glabrous, or puberulous on the abaxial margin, 3-ovulate, the gynophore 2.5-3 mm. long, pilosulose, inserted at the top of the hypanthium.

Type Collection: A. Ducke 8461, "campos a E. de Faro," Pará, Brazil, Aug. 1907 (HOLOTYPE presumably at Museo Goeldi, isotypes F-frag., G). Material of this genus has not been received for study from the Museo Goeldi at Belém, Brazil.

Additional Specimens: BRAZIL: Pará: Bas Trombetas, campina do Achipica, Sept. 1910, Ducke 10929 (G); Faro, campos a l'est, May 1911, Ducke 11690 (G, US).

21d. *Macrolobium campestre* var. *arirambense* Cowan, var. nov.

Ramuli minute puberuli. Petiolus 10-20 mm. longus, leviter sulcatus. Foliorum lamina 2-3-jugata, paripinnata; rachibus 15-40 mm. longis, leviter sulcatis. Foliola 4-6.5 cm. longa, 2-3 cm. lata, ovalia ad elliptica, ad basim obtusa, ad apicem abrupte acuta, extremitate acuta. Inflorescentiae 25-28 cm. longae, axe brevipilosulo; bracteis 8 mm. longis, 3 mm. latis, elliptico-lanceolatis, acuminatis, intus glabris, extus brevipilosulis; bracteolis glabris intus, extus pilosis. Flores immaturi vel ab insectis vastati. Fructus (nimis maturus) circa 6 cm. longus, 3 cm. latus, oblongus, glaber, carpophoro 10 mm. longo, glabro.

Type Collection: A. Ducke 14848, "campos do Ariramba, Rio Trombetas," Pará, Brazil, Sept. 1913 (HOLOTYPE G, isotype G).

21e. *Macrolobium campestre* var. *longibracteatum* Cowan, var. nov. Figure 7.

Arbor parva, ramulis foliisque glabris. Petiolus 20-28 mm. longus, leviter canaliculatus. Folia 2-3-jugata, paripinnata; rachibus 3-5 cm. longis, leviter canaliculatis. Foliola 6-11.5 cm. longa, 2.5-4.5 cm. lata, ovata, ovato-lanceolata vel lanceolata, ad basim obtusa ad acuta, ad apicem acuminata. Inflorescentiae 16-18.5 cm. longae, axe brevi-pilosulo; bracteis 10-12.5 mm. longis, lanceolatis, acuminatis, brevi-pilosulis; bracteolis 8.5 mm. longis, 3 mm. latis, ellipticis, acuminatis, extus pilosulis, intus glabris vel sparsissime brevi-pilosulis. Sepala 2-3.5 mm. longa, 1-2 mm. lata, lanceolata. Petali lamina 4 mm. longa, 6 mm. lata, unguicilo 5 mm. longo. Ovarium 2-3 mm. longum, 1 mm. latum, glabrum, 3-ovulatum, gynophoro 1.5 mm. longo, puberulo. Fructus ignotus.

Type Collection: A. Ducke 1242, "Entroncamento, Belém," Pará, Brazil, June 1943 (HOLOTYPE MO, isotypes IAN, NY, US).

Unquestionably, the relationship of this species is with *M. arenarium*, but this pair of species is completely without ties to the other species of the genus. They may be regarded as the two extremes of a distinct line of relationship from which one group of unijugate species may have diverged. *Macrolobium campestre* exhibits the following characters which amply distinguish it from its only certain relative: (1) it has 2-3-jugate leaf blades, and (2) its bracts and bracteoles are pubescent, on one side at least.

Five subspecific taxa are recognized within this species and are here treated as varieties. Though these are "definitely accepted by the author," there is the realization that future collecting within the range of the species may very well merge some of the less distinct of these. However, in view of the data available, this disposition of the variants appears to be at least a practical solution to the problem.

Plants of the typical variety may be recognized by their shrubby habit, their relatively broad leaflets and by their pilose bracts. Only var. *arirambense* approaches it in aspect and the latter (var. *arirambense*) has very elongate inflorescences, the axis of which is short-pilosulose and its branchlets are puberulous. The relationship of the last-mentioned variety is much nearer var. *longibracteatum*, from which it is distinguished by its puberulous branchlets, differently shaped and smaller leaflets, longer inflorescences, and smaller bracts. The inflorescences of var. *longibracteatum* and *arirambense* are considerably longer than in any of the other varieties and are distinctly arcuate, suggesting that they may be pendent in nature.

Var. *arboreum* is quite distinct by virtue of its narrow leaflets which are smaller on the average than those of plants of the other varieties. It becomes a tree of considerable proportions, attaining heights of 35 m. according to the field notes of B. A. Krukoff. These characteristics and its longer, differently shaped bracts serve to separate it from its nearest relative, var. *medium*. As the epithet of the latter implies, this variety is transitional, between var. *longibracteatum* and *arboreum*. Its shorter bracts, puberulous bracteoles and shorter inflorescences serve to distinguish it from var. *longibracteatum*.

22. *Macrolobium arenarium* Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 101. 1922.**Figure 7.**

Low shrub to 2 m. tall, the branchlets and leaves glabrous. Petioles 9-17 mm. long, terete. Petiolules 3-5 mm. long. Leaflets 5.5-10.5 cm. long, 3-5 cm. wide, equilateral, ovate to oval, the base equilateral, obtuse, the apex abruptly acuminate or subacuminate, the extremity obtuse to acute; costa strongly impressed on the upper surface, salient beneath, the venules subobscure. Inflorescences 4-5.5

cm. long, sessile, the axis glabrous or pilosulose; bracts 8.5–12.5 mm. long, 3–3.5 mm. wide, lanceolate, caudate-acuminate, sparingly ciliolate, the pedicels about 3–4 mm. long, glabrous or pilosulose; bracteoles 6–6.5 mm. long, 3.5 mm. wide, oblanceolate, or oblong-elliptic, the apex tufted and acute, glabrous otherwise. *Hypanthium* 1.5–2 mm. long, glabrous. *Sepals* five, the adaxial pair united nearly completely, 3.5–4 mm. long, 1–2 mm. wide, elliptic, acute to acuminate, glabrous except for the tufted apex. *Petal* blade 4–5.5 mm. long, 4.5–6.5 mm. wide, suborbicular to transversely oval, the claw 4 mm. long, glabrous externally, villosulose within. *Filaments* 15–20 mm. long, villosulose to pilosulose in the lower part. *Pistil* glabrous; stigma capitellate; style about 18 mm. long; ovary 3.5 mm. long, 1.5 mm. wide, narrowly oblong, 3–4-ovulate, the gynophore 2.5–3.5 mm. long, inserted in the base of the hypanthium. *Fruit* (post-mature) apparently elongate-oblong, the carpophores 10 mm. long.

LECTOTYPE: *A. Ducke* (H.A.M.P. No.) 15831, "Bella Vista, Rio Tapajóz, pres du dernier rapide," Pará, Brazil, Dec. 1915 (presumably deposited at Museo Goeldi, isolectotype G). The material of this genus in the Museo Goeldi has not been received for study.

Additional Specimens: BRAZIL: Campina do Perdido, prope Bella Vista, Pará, May 1923, *Ducke* (H.J.B.R. No.) 10916 (G, NY, P, RB, U, US); Bella Vista, Rio Tapajóz, Pará, June 1918, *Ducke* (H.A.M.P. No.) 17054 (G, US).

The latter collection and the lectotype collection were cited by *Ducke* in his original description but neither was designated as the type. Thus the selection of a lectotype was mandatory. *Ducke* stated in the discussion following the description of the species that the inflorescence was glabrous but one of the collections which he cited, *Ducke* 17054, has pilosulose inflorescences. Consequently, the other one was chosen for the lectotype because it was felt that it best typified *Ducke's* concept.

The petiolulate, equilateral leaflets of this species lend such a distinctive aspect to this plant that it is inconceivable that it might be confused with any of the other unjugate members of this section. It is intimately related to *M. campestre*, which has more than a single pair of leaflets per leaf, and bracts and bracteoles which are pubescent on one or both sides.

23. *Macrolobium canaliculatum* Spruce ex Benth. in Mart. Fl. Bras. 15(2): 219. 1870. Figure 8.

Vouapa canaliculata (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 393. 189.

Vuapa canaliculata (Spruce ex Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Small tree to about 12 m., the branchlets very minutely puberulous. *Petioles* 6–11 mm. long, very minutely puberulous, strongly canaliculate, depressed dorsiventrally. *Petiolules* 3–10 mm. long, very minutely puberulous. *Leaflets* 5.5–12 cm. long, 2.5–4.5 cm. wide, subequilateral, slightly arcuate, elliptic or oblong-elliptic, the base inequilateral, acute, the lower side long-decurrent on the petiolules, the leaflets narrowing toward the rotund-obtuse, entire or emarginate apex, very minutely puberulous at the base, epunctate; costa plane on the upper surface, salient beneath, the venules prominulous to prominent. *Inflorescences* 4–6.5 cm. long, the axis very minutely puberulous, the peduncles 6–11 mm. long; bracts 1.5 mm. long, 1–1.5 mm. wide, deciduous, triangular, ciliolate; pedicels 4–7 mm. long, glabrous; bracteoles 10.5 mm. long, 5 mm. wide, oblong-oblanceolate, glabrous. *Hypanthium* 3.5 mm. long on a stipe 3.5 mm. long, both glabrous. *Sepals* four, the adaxial one sometimes bifid, 9.5–11 mm. long, 3–4.5 mm. wide, elliptic to oblong, obtuse, ciliolate, glabrous otherwise. *Petal* usually retrorse, the blade 6–7 mm. long, 7–8 mm. wide, suborbicular, glabrous, the claw 6.5–7 mm. long, auriculate, villosulose on the costa of the claw, the auricles ciliolate; scale-like

petalodia sometimes present. *Filaments* 20 mm. long, villosulose basally. *Stigma* capitate. *Style* 17 mm. long, glabrous. *Ovary* 3.5-4.5 mm. long, 1.5-2 mm. wide, oblong, glabrous, 3-5-ovulate, the gynophore 2.5 mm. long, glabrous. *Fruit* (old valves) about 9.5-13 cm. long, 4.5-5 cm. wide, oblong, strongly alate on the adaxial margin, the carpophore 10 mm. long, glabrous; seeds 3-5 per fruit, oval.

Type Collection: *R. Spruce* 2781, "In sylvis humilioribus fl. Uaupés," Amazonas, Brazil, Dec. 1852 (HOLOTYPE K, isotypes G, GH, NY, P, W).

Additional Specimens: BRAZIL: Upper Rio Curicuriary, trib. of Rio Negro, Nov. 1936, *Ducke* 35190 (RB, US).

VENEZUELA: Cerro Yavita, Río Atabapo, Amazonas, Oct. 1950, *Maguire* 29284 (NY, US).

There is ample morphologic evidence for assuming a rather close relationship between this species and *M. punctatum*. They both have a long-stipitate hypanthium and petiolulate leaflets, and they have a similar aspect. *M. canaliculatum* may be distinguished from its near relative by its epunctate leaflets, the apices of which are rotund-obtuse. In addition, *M. punctatum* also has much shorter sepals, smaller bracteoles, and narrower petal blade, and the petal is usually erect.

24. *Macrolobium punctatum* Spruce ex Benth. in Mart. Fl. Bras. 15(2): 219. 1870. Figure 8.

Vouapa punctata (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 394. 1891.

Vuapa punctata (Spruce ex Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Macrolobium punctatum Spruce ex Benth. forma *bijugum* Ducke, Arch. Inst. Biol. Veg. Rio de Janeiro 4: 14. 1938.

Shrub or small tree to 8 m. tall, the branchlets very minutely puberulous. *Petioles* 9-20 mm. long, sulcate on the upper surface, flattened dorso-ventrally, glabrous or very minutely puberulous. *Petiolules* 2-6 mm. long, glabrous or very minutely puberulous. *Leaflets* (8-)11(-16) cm. long, (2.5-)4(-6.5) cm. wide, strongly inequilateral, falcate, elliptic or lanceolate, the base strongly inequilateral, the



FIG. 8. Geographic distribution of *M. canaliculatum*, *M. punctatum*, *M. unijugum*, and *M. klugii*.

lower side rotund and long-decurrent, the upper side acute, the apex acute to acuminate, the extremity blunt, entire or emarginate; glabrous or the base very minutely puberulous on both surfaces or only on the upper surface, often conspicuously punctate beneath; costa somewhat salient on both sides, the venules prominent, or only prominulous beneath. *Inflorescences* 4-7.5 cm. long, the axis glabrous or very minutely puberulous, the peduncles 3-11 mm. long; bracts 1.5-2 mm. long, 1 mm. wide, caducous, triangular, glabrous except for the ciliolate margins; pedicels (1-)2.5-8 mm. long, glabrous or minutely puberulous; bracteoles 3.5-8 mm. long, 2-3.5 mm. wide, often caducous, oblong or oblong-obovate, carnose-coriaceous, the apex rotund, apiculate or cuspidate, glabrous. *Hypanthium* 2.5-3.5 mm. long, on a stipe 2-4 mm. long, glabrous. *Sepals* four, 4-7.5 mm. long, 2-4 mm. wide, oblong, apically rotund, concave, glabrous or somewhat ciliolate. *Petal* blade 3.5-6 mm. long, 4-4.5 mm. wide, oval to suborbicular, the claw 4-5.5 mm. long, auriculate basally, glabrous externally or pilosulose basally, ciliolate on the base of the claw, villosulose within on the claw and up to the center of the blade on the costa. *Filaments* 13.5-19.5 mm. long, villose in the lower part. *Stigma* capitate. *Style* 10-13 mm. long, glabrous. *Ovary* 2.5-4 mm. long, 1.5-2 mm. wide, more or less elliptic, the adaxial margin strongly alate, 2-4-ovulate, glabrous, the gynophore 2-2.5 mm. long, glabrous, inserted at the top of the adaxial wall of the hypanthium. *Fruit* (sub-mature) 6.5-15 cm. long, 4-5 cm. wide, oblong, glabrous, the adaxial margin with prominent thin wings, the carpophores 9-11 mm. long, glabrous. *Seeds* four per fruit, obovate (immature).

Type Collection: R. Spruce 2734, "In sylvis humilioribus circa Panure," Brazil, Dec. 1852 (HOLOTYPE K, isotypes G, GH, NY, P, W).

Additional Specimens: BRAZIL: Amazonas: João da Lapa, Estacamento, Rio Içana, May 1948, *Black* 48-2731 (NY, U); Miri, Rio Tarumá, Manáos, Jan. 1946, *Ducke* 1871 (F, GH, IAN, NY, US); campos a L'est de Faro, Jan. 1916, *Ducke* (H.A.M.P. No.) 15911 (also cited as H.A.M.P. No. 15976 and H.J.B.R. No. 10910) (G, P, RB, US); Campina da Ponta Negra, Manáos, Oct. 1929, *Ducke* 23292 and April 1932, *Ducke* 23292-A (US); Yucahy, above mouth of Rio Curicuriary, upper Rio Negro, Nov. 1929, *Ducke* 23294 (G, P, U, US); Camanaos, Rio Negro, Sept. 1935, *Ducke* (H.J.B.R. No.) 35191 (K) (type collection of *M. punctatum* fm. *bijugum* Ducke); Rio Negro, Padauriy, São Pedro, Oct. 1947, *Froes* 22655 and 22664 (IAN); Rio Uaupés, Panure, Nov. 1947, *Pires* 1091 (IAN); Rio Vaupés between Ipanoré and confluence of Rio Negro, Nov. 1947, *Schultes & Pires* 9120 (US).

In this section there are only three species with a single pair of leaflets which are petiolulate, the above species, *M. canaliculatum*, and *M. arenarium*. The latter species is perhaps the most distinct of the species in the section because of its equilateral, oval or ovate leaflets which are not at all arcuate or falcate. *M. punctatum* most closely approaches *M. canaliculatum* but it may be distinguished by the usually strong punctuation of the leaflets of the former as well as by its narrower, more or less erect petal, and smaller bracteoles. *M. canaliculatum* has the petal strongly recurved and much larger bracteoles.

There seems to be no justification for maintaining Ducke's forma *bijugum*, the sole difference being that some of the leaves have two pairs of leaflets.

25. *Maclobium unijugum* (Poepp. & Endl.) Cowan, comb. nov. Figure 8.

Inga unijuga Poepp. & Endl. Nov. Gen. & Sp. Pl. 3: 79. 1845.

Tree or shrub 3-23 m. tall, the branchlets very minutely puberulous or glabrous. *Petioles* 8-25 mm. long, subsulcate to canaliculate, very minutely puberulous or glabrous. *Petiolules* to 3 mm. long sometimes present. *Leaflets* 10.5-30 cm. long, 3-10 cm. wide, inequilateral to subequilateral, more or less arcuate, elliptic, the base inequilateral, acute, decurrent, the apex obtusely acute to acuminate, the extremity rounded-truncate or acute; upper surface minutely puberulous on the costa or glabrous, beneath glabrous or minutely puberulous on the

costa or also on the primaries, punctate or epunctate beneath; costa and primaries more or less impressed on the upper surface, salient beneath, the intramarginal nerve usually strongly developed. *Inflorescence* 1.5-7 cm. long, several fasciculate in loose clusters or solitary, the axis minutely puberulous, sessile or the peduncle to 2.5 mm. long; bracts 1-1.5 mm. long and wide, caducous, triangular, oblong, triangular-oblong or semicircular, ciliolate, glabrous within, minutely puberulous externally, acute to obtuse; pedicels 1.5-4.5 mm. long; bracteoles 4.5-7.5 mm. long, 2.5-5 mm. wide, rotund, apiculate or mucronate, oblong, obovate, or oblong-obovate, concave, glabrous on the inner surface, minutely puberulous externally. *Hypanthium* 1-3.5 mm. long on a stipe 0.5-1.5 mm. long, glabrous. *Sepals* four or five, 2-7 mm. long, 1-5 mm. wide, obtuse or acuminate, oblong, lanceolate, triangular, or oval, ciliolate, glabrous within, glabrous to sparsely puberulous externally. *Petal* blade 4.5-6.5 mm. long, 4-7 mm. wide, oval to orbicular, the claw 3-6.5 mm. long, auriculate or non-auriculate, glabrous externally or pilosulose at the base, ciliolate in the lower part of the claw, villose within on the claw and into the throat or to the center of the blade, or the blade glabrous. *Filaments* 15-25 mm. long, more or less villose or villosulose basally, the anthers 1.5-2.5 mm. long, 1-1.5 mm. wide. *Stigma* simple or capitellate. *Style* 12-18.5 mm. long, glabrous to sparsely puberulous basally. *Ovary* 1.5-2.5 mm. long, 1-1.5 mm. wide, oval to oblong to elliptic, puberulous on the margins, glabrous on the lateral surfaces, rarely puberulous on all surfaces, 2-6-ovulate; gynophore 2-3.5 mm. long, glabrous or minutely puberulous, inserted at the margin of the hypanthium. *Fruit* 10 cm. long, 6.5 cm. wide, obovate, glabrous, irregularly salient-venose, the adaxial margin with woody wings.

Key to the Varieties of *Macrolobium unijugum*

1. Costa and primary veins, including intramarginal vein, markedly impressed on upper leaflet surface, leaflets punctate beneath; inflorescences 1.5-4.5 cm. long, several fasciculate in loose clusters. 25c. var. *unijugum*.
1. Costa impressed but primaries not impressed on upper surface, leaflets epunctate beneath; inflorescences 4.5-7 cm. long, borne singly or few together but not in loose clusters. 2.
2. Sepals five, lanceolate, 2-3 mm. long; hypanthium 1 mm. long on 0.5 mm. stipe; apex of bracteoles apiculate; anthers 1.5 mm. long, oval; leaflets sessile. Northern British Guiana. 25a. var. *fanshawei*.
2. Sepals four, oblong, 6-6.5 mm. long; hypanthium about 2.5 mm. long on 1 mm. stipe; apex of bracteoles mucronate; anthers 2.5 mm. long, oblong; leaflets sometimes with petiolules to 3 mm. long. Northwesternmost Brazil. 25b. var. *mucronatum*.

25a. *Macrolobium unijugum* var. *fanshawei* Cowan, var. nov. Figure 8.

Arbor 20 m. alta, 2 dm. diametro, ramulis glabris. Petiolus 12-15 mm. longus, canaliculatus, glaber. Foliola 12-18.5 cm. longa, 4.5-7 cm. lata, subaequalateralis, elliptica, ad basim inaequalateralis, acuta, ad apicem abrupte acuminata, extremitate obtuso, glabra, epunctata, costa impressa supra, infra salienti, venulis subobscuris supra, infra prominentibus. Inflorescentiae 5 cm. longae, solitariae, axe minute puberulo, pedunculis 2-2.5 mm. longis; bracteis caducis; pedicello 3.5-4 mm. longo, minute puberulo; bracteolis 6 mm. longis, 3 mm. latis, oblongis, apiculatis, intus glabris, extus minute puberulis. Hypanthium 1 mm. longum, stipite 0.5 mm. longo, glabrum. Sepala quinque, 2-3 mm. longa, 1-1.5 mm. lata, duobus adaxilibus triangularibus, acuminatis, 3 ceteris lanceolatis, acuminatis, ad apicem ciliolatis. Petali lamina 5 mm. diametro, orbicularis, unguicilo 4 mm. longo, exauriculato. Filamenta 17.5 mm. longa, basim versus sparse villosula, antherae 1.5 mm. longae, 1 mm. latae. Stigma subpeltato-capitellatum. Stylus 15.5 mm. longus, glaber. Ovarium 2 mm. longum, 1 mm. latum, oblongum, solum mar-

ginibus puberulis, lateraliter glabrum, 2-ovulatum, gynophoro 3 mm. longo, minute puberulo.

Type Collection: *D. B. Fanshawe* 752 (F.D. 3488), "Mahdia Ck., Potaro R., 108 m. Bartica-Potaro Road," British Guiana, June 1942 (HOLOTYPE BGF). Known only by the type collection.

25b. *Macrobium unijugum* var. *mucronatum* Cowan, var. nov. Figure 8.

Arbor parva, ramulis minutissime puberulis. Petiolus 18-25 mm. longus, leviter sulcatus, minutissime puberulus. Petioluli (0-)3 mm. longi. Foliola 20-30 cm. longa, 5.5-9 cm. lata, plus minusve aequilateralia, elliptica, ad basim inaequilateralia, acuta, ad apicem acuminata, extremitate obtusa vel acuta, superficie epunctata, supra glabra, infra in costa minutissime puberula; costa impressa supra, infra salienti, venulis prominulis supra, infra prominentibus. Inflorescentiae 4.5-7 cm. longae, axe minutissime puberulo; bracteis 1.5 mm. longis et latis, triangulari-oblongis, ciliolatis, intus glabris, extus minute puberulis; pedicelli 2-3 mm. longi; bracteolis 7.5 mm. longis, 4 mm. latis, oblongo-obovatis, valde mucronatis, intus glabris, extus minute puberulis. Hypanthium 2.5 mm. longum, stipite 1 mm. longo, glabrum. Sepala quattuor, 6-6.5 mm. longa, 2-3 mm. lata, oblonga, obtusa, glabra vel sparse ciliolata. Petali lamina 6 mm. longa, 5 mm. lata, ovalis, glabra, unguicilo 5.5 mm. longo, exauriculato. Filamenta 20.5 mm. longa, basim versus sparse villosula, antheris 2.5 mm. longis, 1.5 mm. latis, oblongis. Stigma capitellatum. Stylus 18.5 mm. longus, ad basim sparse puberulus. Ovarium 2 mm. longum, 1 mm. latum, oblongo-ovale, puberulum, 2-ovulatum, gynophoro 2.5 mm. longo, puberulo.

Type Collection: *A. Ducke* 35188, "Igarapé Yurupary affl. Rio Uaupés," Amazonas, Brazil, Sept. 1935 (HOLOTYPE US, isotypes G, P, U). Known only by the type collection.

25c. *Macrobium unijugum* var. *unijugum*. Figure 8.

Inga unijuga Poepp. & Endl. Nov. Gen. & Sp. Pl. 3: 79. 1845.

Macrobium limbatum Spruce ex Benth. Trans. Linn. Soc. 25: 307. 1865.

Vouapa limbata (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 393. 1891.

Vuapa unijuga (Poepp. & Endl.) Kuntze, Rev. Gen. 1: 213. 1891.

Tree 3-23 m. tall, branchlets very minutely puberulous. Petioles (8-)15-20 (-25) mm. long, subsulcate, very minutely puberulous. Leaflets 10.5-30 cm. long, 3-11 cm. wide, sessile, punctate on the lower surface, the base acute, the apex bluntly acute or subacuminate; costa and primary veins strongly impressed on the upper surface, the intramarginal vein prominently produced. Inflorescences 1.5-4.5 cm. long, several fasciculate in loose clusters; bracteoles obovate or oblong-obovate, rotund apically or sometimes apiculate. Hypanthium 2-3.5 mm. long. Sepals four, 4-7 mm. long, 2-5 mm. wide, oblong or oval, obtuse. Anthers 1.5 mm. long, 1 mm. wide.

Type Collection: *E. Poeppig* 2801, "Brasilica. In sylvis ad Ega," Nov. 1831. (HOLOTYPE W, isotypes P, W).

Additional Specimens: BRAZIL: Amazonas: Manáos, Aug. 1935, *Ducke* 22 (A, F, IAN, MO, NY, US); São Paulo de Olivença, Nov. 1927, *Ducke* 20316 (G, U, US); circa Cachoeira do Mindu, Manáos, Sept. 1929, *Ducke* (H.J.B.R. No.) 23295 (G, RB, U, US); Manáos, Feb. 1945, *Froes* 20497 (IAN); Porto Cucuruhy, Rio Negro, Oct. 1945, *Froes* 21114 (F, IAN, NY), 21114a (IAN, NY, U); Manáos, Oct. 1929, *Killip & Smith* 30157 (A, F, NY, US); near Tres Casas, Municip. Humaytá, Sept.-Oct. 1934, *Krukoff* 6243 (A, F, MO, NY, U, US); Rio Uaupés, afl. do Rio Negro, April 1947, *Pires* 326 (IAN, NY); Tefé, Oct. 1948, *Pires* 1308 (IAN); Rio Vaupés between Ipanoré and confluence of Rio Negro, Taracua, Nov. 1947, *Schultes & Pires* 9032 (US); in caatingas secus fluv. Uaupés, Nov. 1852, *Spruce* 2668 (type collection of *Macrobium limbatum*; HOLOTYPE K, isotypes G, GH, NY, P, W).

PERU: Loreto: Mishuyacu near Iquitos, Oct.-Nov. 1929, *Klug* 418 (F, NY, US) and Dec. 1929, *Klug* 663 (F, NY, US); Balsapuerto, Jan. 1933, *Klug* 2867 (A, F, G, GH, MO,

NY, US); Sachachoro, near Yurimaguas, Oct. 1931, *Mexia* 6088 (F, G, GH, MO, NY, U, UC, US).

VENEZUELA: San Antonio, Río Orinoco, Amazonas, April 1942, *Williams* 15076 (F, US, VEN).

Vernacular Names: Brazil: "faveira."

This species, the two preceding ones, and the one following have been interpreted as comprising a complex which may have diverged from the *M. campestre*-*M. arenarium* line of relationship. However, this disposition is admittedly more a matter of convenience than of any very impressive morphology.

Unquestionably, the nearest relative of *M. unijugum* is the following species, *M. klugii*. The leaflets of *M. unijugum* are quite different in shape and are borne on generally longer petioles, and its ovary is more or less pubescent.

The typical variety has a somewhat different aspect, largely because the costa and primary veins are strongly impressed on the upper leaflet surface, while only the costa is impressed in the other varieties. Its shorter inflorescences, fasciculate in loose clusters, also lend a distinctive aspect to the typical form. These characters separate it from its nearest relative, variety *mucronatum*, but the latter also has mucronate bracteoles, longer anthers, and leaflets which are sometimes petiolulate.

Var. *fanshawei* is named in honor of Mr. D. B. Fanshawe, Conservator of Forests of British Guiana and outstanding student of the flora of this region. It is to be distinguished from the other varieties by its five, smaller sepals, which are somewhat dimorphic, and by its disjunct geographic distribution.

Inga unijuga was described in 1845 on the basis of *Poeppig* 2801, although this number (nor any other number) was not cited in the original description. In 1870 Bentham described *Macrolobium limbatum* with a Spruce collection as the basis and it was not recognized that the two were synonymous until 1891 when Kuntze transferred the species to *Vouapa* as *V. unijuga*. There is no doubt that the two names apply to the same taxon after one has studied both collections.

The Poeppig collection was very probably sterile. The initial description states that the portion relating to the legume was taken from field notes. Whereas the flowers of other species described by Poeppig and Endlicher at the same time and in the same place were quite abundantly characterized, those of *I. unijuga* were described only as "Flores albi." It is probable that Poeppig only observed the flower color without obtaining flowering material. In fact, the label on the Paris sheet specifically states that he made the collection without flowers and fruit ("sine fl. et fr. legi").

Besides the sheet at Paris, which is identified only as "Inga?", there are two sheets at Vienna, one of which is annotated as "Inga unijuga Poepp." and is regarded as the holotype.

26. *Macrolobium klugii* Cowan, sp. nov. Figure 8.

Arbustum 2 m. altum, ramulis glabris. Petiolus 7-9 mm. longus, leviter sulcatus, glaber. Foliola 11.5-17 cm. longa, 2.5-4.5 cm. lata, subaequalia, angusto-elliptica, ad basim inaequalia, acuta, decurrentia, ad apicem acuta et extremitate acuta, glabra, epunctata; costa leviter impressa supra, infra valdissime salienti, venulis prominulis. Inflorescentiae circa 4 cm. longae, terminales, axe minutissime puberulo; bracteis caducis, 1 mm. longis et latis, ovatis, caudato-acuminatis, intus glabris, extus minuto-puberulis, ciliolatis; pedicelli 4-5 mm. longi; bracteolis 6.5 mm. longis, 3 mm. latis, ellipticis, intus glabris, extus minutissime puberulis. Hypanthium 2 mm. longum, sessile, glabrum. Sepala quattuor, 5-5.5 mm. longa, 1.5-2 mm. lata, oblonga, vel ovali-elliptica, obtusa, glabra. Petalum ignotum. Filamenta 17.5 mm. longa, ad basim sparse villosa. Stigma nonnihil peltatum. Stylus 12.5 mm. longus, glaber. Ovarium 2 mm. longum,

1 mm. latum, oblongum, glabrum, 5-ovulatum, gynophoro 2.5 mm. longo, glabro vel sparsissime puberulo. Fructus ignotus.

Type Collection: *G. Klug 1353*, "Mishuyacu near Iquitos, alt. 100 meters, forest," Dept. Loreto, Peru, May 1930 (HOLOTYPE US, isotype F).

The characters of *M. klugii* place it nearest *M. unijugum* from which it differs in its narrowly elliptic leaflets borne on much shorter petioles and its completely glabrous ovary.

27. *Macrolobium bifolium* (Aubl.) Pers. Syn. Pl. 1: 39. 1805. Figure 9.

Vouapa bifolia Aubl. Pl. Guian. 1: 25. pl. 7. 1775.

Macrolobium Vouapa Gmel. Syst. Nat. ed. 13. 2(1): 93. 1796.

Macrolobium hymenaeoides Willd. Sp. Pl. 1: 186. 1797.

Vuapa bifolia (Aubl.) J. St.-Hil. Expos. Fam. 2: 209. 1805.

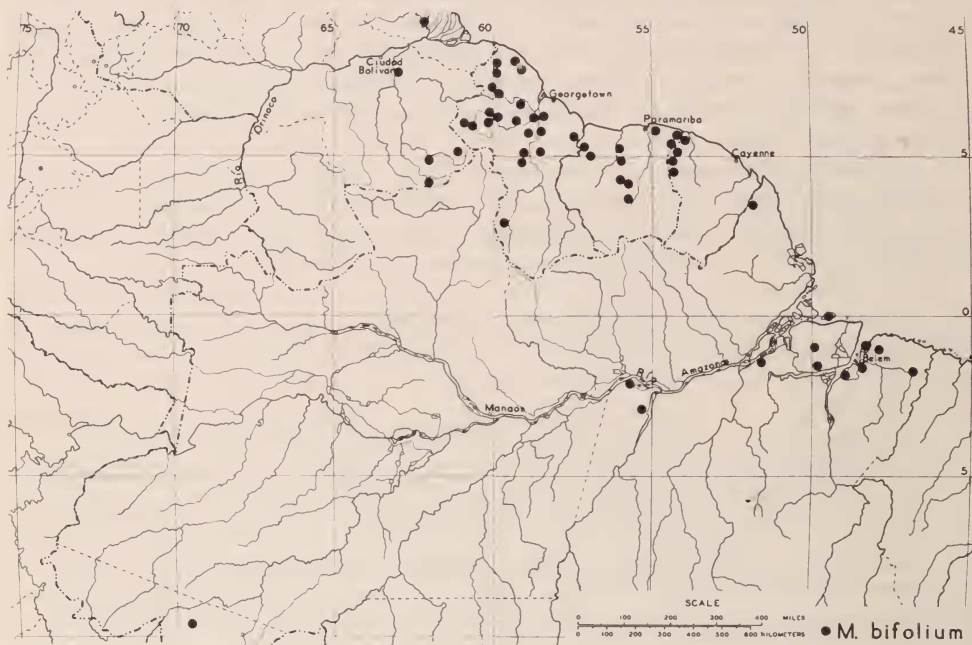


FIG. 9. Geographic distribution of *M. bifolium*.

Macrolobium stamineum Mey. Prim. Fl. Esseq. 18. 1818.

Vouapa staminea (Mey.) DC. Prodr. 2: 511. 1825.

Macrolobium elegans Miq. Ann. Sci. Nat. III. 1: 40. 1844.

Tree 2-20 m. tall, 2-4 dm. in diameter, the branchlets and leaves glabrous or rarely the branchlets very minutely puberulous. *Petioles* (4-)10(-18) mm. long, canaliculate on the upper surface; the rachis rudiment about 5.5 mm. long, early caducous, linear-acicular. *Leaflets* (6.5-)10(-24) cm. long, (2.5-)4(-8) cm. wide, inequilateral, arcuate to falcate, elliptic to oblong, the base inequilateral, acute, the apex acute to acuminate, the extremity usually obtuse, entire to emarginate, epunctate; costa sulcate above, salient on the lower surface, the venules prominent to conspicuous. *Inflorescences* to 19.5 cm. long, averaging about 5-7 cm. long, borne singly or 2-5 in fascicles, the axis densely puberulous, the peduncles 1-6 mm. long; bracts 0.5-2 mm. long, 1-2 mm. wide, caducous, triangular, acute, ciliate, glabrous within, densely puberulous externally; pedicels (1.5-)5(-6.5) mm. long, densely puberulous; bracteoles (3-)5(-8.5) mm. long, 2.5-4.5 mm. wide,

usually oval, oblong, or elliptic, the apex acute, glabrous within, densely puberulous externally. *Hypanthium* 1-2.5 mm. long on a stipe to 1.5 mm. long, both usually sparsely and minutely puberulous. *Sepals* typically four, infrequently five (the adaxial pair incompletely united), (3-)5(-6.5) mm. long, (1.5-)2.5(-4.5) mm. wide, oblong to elliptic, infrequently lanceolate or ovate, usually obtuse, sometimes acute to acuminate, more or less minutely puberulous on the costa externally or glabrous. *Petal* blade (4-)5(-6(-7.5) mm. long, (3.5-)5(-8) mm. wide, oval or orbicular, infrequently transversely oval, the claw (3.5-)5(-7.5) mm. long, subauriculate to auriculate basally, glabrous externally or pilose sparingly at the base, sparingly to strongly villose within, the claw more or less ciliolate. *Filaments* (14-)20(-24) mm. long, villose in the lower part. *Stigma* simple or capitate. *Style* (12-)20(-25.5) mm. long, pilosulose at the base. *Ovary* 1-3 mm. long, 1-1.5 mm. wide, oval to oblong or ovate, pilosulose on one or both margins, papillate-puberulous on the lateral surfaces, or papillate-puberulous or puberulous on all surfaces, (1-)2(-3)-ovulate; gynophore 2-4 mm. long, pilosulose and papillate-puberulous or only papillate-puberulous, inserted at any point between the base and the apex of the hypanthium on the adaxial wall. *Fruit* 8-14 cm. long, 4-8.5 cm. wide, asymmetrically oblong or oval-oblong, broader toward the apex, the adaxial margin dilated into thick wing-like ridges, densely and minutely papillate, the carpophores 4-17 mm. long, glabrous to sparingly pilosulose or minutely papillate. *Seed* one per fruit, 3-4.5 cm. long, 2-4 cm. wide, oblong, oval, or orbicular, the testa crustose and more or less reticulate-venose.

Type Collection: *F. Aublet* s.n., "Cayenne" (isotype BM).

Additional Specimens: BRAZIL: Rio de Janeiro: Cult. Horto Bot. Rio de Janeiro, Feb. 1916, *Constantino* (H. J. B. R. No.) 7621 (RB, U, US); Bot. Gds. Rio de Janeiro, June 1918, *Whitford* 33 (GH, US, Y). Pará: Utinga, Belém, Aug. 1942, *Archer* 7611 (NY); South Forest of I.A.N. Belém, Nov. 1942, *Archer* 7885 (F); Belém, coffee plantation of I.A.N., Oct. 1947, *Black* 831 (IAN); Antonio Lemos, Igarapé Pixuna, July 1948, *Black* 48-2993 (IAN, U); near Oiapoque, Terr. Amapá, Oct. 1949, *Black* 49-8300 (IAN); Pará, Nov. 1829, *Burchell* 9746 (GH, NY); Boa Vista, Rio Tapajó, Aug. 1932, *Capucho* 393 (F, IAN); Utinga, Belém, Oct. 1940, *Ducke* 592 (F, IAN, MO, NY, US); forest reserve, Belém, Aug. 1942, *Ducke* 7611 (F, NY); Santa Izabel, Belém-Bragança, Sept. 1908, *Ducke* 9675 (G, US); Faro, May 1911, *Ducke* 11696 (G, U); Obidos, campos do Mariapixy, July 1912, *Ducke* 11953 (G); Garupá, Dec. 1916, *Ducke* 16691 (G, P, US); Insulis Breves, May 1923, *Ducke* 16942 (U); Castanhal, Colonia 3 de Outubro, Dec. 1949, *Froes* 24891 (IAN, NY); Rio Oiapoque, Terr. Amapá, Jan. 1950, *Froes* 25703 (IAN) and Oct. 1950, 26713 (IAN, NY); Belém do Pará, Nov. 1902, *Goeldi* 3011 (G); Igarapé Mexiana, Sept. 1901, *Guedes* 2297 (G); Ourém, Rio Guamá, Dec. 1899, *Huber* 1810 (G); Rio Aramá, Breves, March 1900, *Huber* 1891 and 1892 (G); Ilha do Mosqueiro near Pará, Nov. 1929, *Killip & Smith* 30662 (NY, US, W); near Abaeté, Aug. 1934, *Krukoff* 5861a (A, MO, NY, U, US); Ilha Marajó, Nov. 1907, *Lutz* 9474 (U); Santa Maria, Thomé Assú, Dist. Acará, July 1931, *Mexia* 5935 (F, GH, MO, NY, U, UC, US); Belém, Utinga, Aug. 1945, *Pires & Black* 98 (IAN); Bussuquara, Utinga, Belém, Nov. 1945, *Pires & Black* 790 (IAN, NY); Belém, near Euna, Sept. 1942, *da Silva* 97 (IAN).

VENEZUELA: Bolívar: Río Caroní, May 1945, *Cardona* 1159 (US, VEN); Río Uonán, afluyente del Ikabaru, Oct. 1946, *Cardona* 1707 (NY, US, VEN); Río Uaiparú, afl. del Ikabaru, 1946, *Cardona* 1913 (NY); orillas del río Iktebe, *Cardona* 2161 (VEN); orillas del río Cuyuni, Feb. 1949, *Cardona* 2790 (NY); Sta. Elena de Uairén, alto Caroní, April 1946, *Lasser* 1438 (NY); Sta. Elena, Río Uairén, Gran Sabana, March 1946, *Tamayo* 3156 (US, VEN). Delta Amacuro: Orinoco Delta, Río Manimo, March 1911, *Bond, Gillin & Brown* 215 (GH, NY, US).

BRITISH GUIANA: Kalacoon, Mazaruni R., Oct. 1923, *Altson* 33 (P); Juanita, Amacura R., NW Dist., July 1908, *Anderson* 52 (BGF); Kaituma R., NW Dist., Oct. 1908, *Anderson* 52A (BGF); Arawau R., NW Dist., July 1934, *Archer* 2340 (US); Kartabo Region, Cuyuni R., Aug. 1920, *I. W. Bailey* 108, 173 (GH); Waini R., NW Dist., Sept. 1921, *de la Cruz* 1126 (GH, NY, US); upper Rupununi R., near Dadanawa, June 1922, *de la Cruz* 1480 (F, G, GH, MO, NY); between Demerara and Berbice Rivers, July 1922, *de la Cruz* 1658 (F, GH, MO, NY, UC, US); upper Mazaruni R., Sept.-Oct. 1922, *de la Cruz* 2247, 2273, 2376 (F, GH, MO, NY, UC, US); Kamakusa, upper Mazaruni R., Nov. 1922, *de la Cruz* 2826 (F, NY, US); Pomeroun R., Pomeroun Dist., Dec. 1922, *de la Cruz* 3228 (F, GH, MO, NY, UC, US);

Wanama R., NW. Dist., May 1923, *de la Cruz* 4016 (F, GH, MO, NY, US); Assakatta, NW. Dist., Sept. 1923, *de la Cruz* 4361 (NY, US); Moraballi Creek, April 1941, *Fanshaue* 693 (F.D. 3429) (BGF, U); bank of Potaro R., Tumatumari, July 1921, *Gleason* 406 (GH, NY, US); Tumatumari, along Potaro R., June-July 1921, *Gleason* 934 (NY); Penal Settlement, Dec. 1919, *Hitchcock* 17243 (GH, NY, US); right bank of Canje R., opposite Kabayari Creek, Dec. 1914, *Hohenkerk* 52-B (BGF); British Guiana, 1843, *Hostmann* 1136 (G); Orealla Savanna, Corantyne R., Sept. 1879, *im Thum s.n.* (P); Orealla, Corantyne R., Oct. 1879, *Jenman* 36 (P); Mazaruni R., Aug. 1889, *Jenman* 5245 (NY); Membaro Creek, upper Mazaruni R., Sept. 1938, P-27 (F.D. 2791) (BGF); British Guiana, June 1924, *Persaud* 34 (F, UC); Membaro Creek, upper Mazaruni R., Sept. 1938, *Pinkus* 29 (F, G, GH, MO, NY, US); Moraballi Creek, near Bartica, Essequibo R., Sept. 1929, *Sandwith* 275 (NY, U); Essequibo R., 1836, *Schomburgk* 10 (G, NY, W); Guiana angl. *Schomburgk* 133 (P, W); Guiana, 1841, *Schomburgk* 210 (G, P, U, W); British Guiana, 1838, *Schomburgk* 375 (F, G, GH, P, US, W); Mazaruni Station, right bank of Mazaruni R., May 1933, *Tutin* 93 (US); Kantume R., July 1908, no collector or number (NY).

SURINAM: Bover Cottica, *Focke* 697 (U) (TYPE of *M. elegans* Miq.); Assirikama, Corantyne R., Sept. 1911, *Gonggrypp* 113 (U); Surinam, *Hostmann* 1056 (GH, P, W); Surinam, 1842, *Hostmann & Kappler* 1136 (F, G, MO, P, U, W); Marowyne R., Sept. 1846, *Kappler* 1930 (P, U); middle Marowyne R., Aug., *Kappler* 2003 (U); Surinam, *McArthur s.n.* (Yale For. Herb. No. 35409) (Y); Tafelberg Creek, Saramacca R., Oct. 1944, *Maguire* 24895 (F, MO, NY, U, US); Surinam, *Miquel s.n.* (NY); Bover-Surinam R., near Goddo, Jan. 1938, *Mt. Wilhemina Exped.* 75 (U); Bover Gran Río Maupedam, Feb. 1938, *Mt. Wilhemina Exped.* 183 (U); Watramiri, Oct. 1918, *Sur. For. Bur.* 4035 (U); Watramiri, March 1919, *Sur. For. Bur.* 4300 (IAN, U); Watramiri, Oct. 1919, *Sur. For. Bur.* 4431 (IAN, U); Watramiri, Feb. 1920, *Sur. For. Bur.* 4546 (MO, U, US); Watramiri, Dec. 1920, *Sur. For. Bur.* 4999 (MO, U); Watramiri, June 1921, *Sur. For. Bur.* 5263 (U); Watramiri, Oct. 1921, *Sur. For. Bur.* 5407 (IAN, MO, U, US); upper Suriname R., June 1921, *Sur. For. Bur.* 5468 (U, US); Watramiri, Dec. 1921, *Sur. For. Bur.* 5579 (U); Coppename inf. Aug. 1903, *Went* 124 (U); *Wullschagel* 819-A (W); Albina, Río Marowyne, Sept. 1853, *Wullschlagel* 1434 (W).

FRENCH GUIANA: Gourdonville, Sept. 1914, *Benoist* 1615 (P); La Charbonnière, Oct. 1948, *For. Service* 4254 (U); Guyane-Française, 1792, *Leblond* 192 (G); Guyane Française, 1834, *Leprieur* 341 (G, P); 1838, *Leprieur s.n.* (P); Cayenne, *Martin s.n.* (F); Maroni, 1845, *Melinon* 5 (GH, P), 1876, *Melinon* 80 (G, P), 1861, *Melinon* 117 (P); Couana, *Melinon* 131 (NY, P, US); Acarouany, 1876, *Melinon* 227 (A, BM, K, P); banks of Maroni R., 1862, *Melinon* 420 (A, F, G, GH, NY, P, US); French Guiana, 1863, *Melinon s.n.* (F, P); Maroni, 1864, *Melinon s.n.* (F, GH, NY, P, US); French Guiana, 1820, *Perrotet s.n.* (G); Guiane, *Poiret s.n.* (P); *Richard s.n.* (P); Karouany 1854, *Sagot* 185 (GH, P); Acarouany, 1856, *Sagot* 185 (P, W); Maroni, *Wachenheim* 184 (P).

Vernacular Names: Brazil: "ipe", "ipezeiro". Venezuela: "parue-dek" (Arenkuna). British Guiana: "sarebebe" (Arawak, "water wallaba", "bootooba". Surinam: "watrabirihoeoe".

The four more or less closely related species, *M. bifolium*, *M. latifolium*, *M. angustifolium*, and *M. duckeanum*, probably constitute a divergent line from the main unijugate line of relationship. Of these, the first two are undoubtedly the most closely related of the four. *Macrolobium bifolium* differs from *M. latifolium* by the former's smaller, less coriaceous bracteoles, and its smaller bracts which are glabrous on the inner surface; and the hairs of all its parts are predominantly ribbon-like. Also, whereas *M. bifolium* is widely distributed, *M. latifolium* is narrowly restricted to the Bahia region of eastern Brazil. The hairs of the latter are clavate and a few such hairs are sometimes to be observed scattered amid the ribbon-like hairs of *M. bifolium*.

This species has more frequently been confused with *M. angustifolium* but they may be separated by a number of good characters. The costa of the leaflets is sulcate on the upper surface in *M. bifolium* but strongly salient in *M. angustifolium*. The shape and size of the bracts are completely different and the bracteoles of the latter species are pubescent on the inner surface, as are the bracts, but glabrous within in *M. bifolium*. The ovary of the latter is pubescent on all surfaces and this pubescence persists on the fruit, but the ovary of its relative is pubescent only on the margins and its fruit is glabrous or with only a few marginal hairs.

28. *Macrolobium latifolium* Vogel, *Linnaea* 1: 414. 1837.*Vouapa latifolia* (Vog.) Taub. Bot. Centralbl. 47: 393. 1891.*Vuapa latifolia* (Vog.) Kuntze, Rev. Gen. 1: 213. 1891.

Shrub 3 m. tall, the branchlets and leaves glabrous or infrequently the branchlets very minutely puberulous. *Petioles* 3-13 mm. long, sulcate to canaliculate. *Leaflets* 5-15 cm. long, 2.5-7 cm. wide, inequilateral, arcuate to subfalcate, elliptic, the base inequilateral, acute, the apex acute, sometimes inequilaterally so, the extremity obtuse, entire or emarginate, punctate or epunctate beneath; costa impressed on the upper surface, salient beneath, the venules prominent. *Inflorescences* 4.5-14 cm. long, the axis densely puberulous, the hairs short and clavate, the peduncle 3-10 mm. long; bracts 3.5-5 mm. long, 2.5-4.5 mm. wide, triangular-ovate, acute, concave, thick-coriaceous, pilosulose on the inner surface, densely puberulous externally; pedicels 1-5 mm. long; bracteoles 6-8.5 mm. long, 3-5.5 mm. wide, very thick-spongiose, slightly apiculate, concave, glabrous within, puberulous externally. *Hypanthium* 2-3 mm. long on a stipe 2-3.5 mm. long, both densely clavate-puberulous. *Sepals* four, 5.5-8 mm. long, 2-4 mm. wide, oblong, elliptic or lanceolate, coriaceous, glabrous within, densely puberulous externally, ciliolate. *Petal* blade 5-8 mm. long, 5-7 mm. wide, orbicular, the claw non-auriculate, 3-5 mm. long, pilosulose at the base externally, ciliolate basally, villose within on the claw and up through the center of the blade. *Filaments* 14-15 mm. long, villosulose in the basal part. *Stigma* simple or slightly enlarged. *Style* 10-13 mm. long, minutely puberulous basally. *Ovary* 3-4.5 mm. long, 1.5-2 mm. wide, oblong, densely clavate-puberulous on all surfaces, 2-3-ovulate; gynophore 3-4.5 mm. long, clavate-puberulous, inserted at any level from midway to the apex of the adaxial hypanthial wall. *Fruit* (submature) 12.5-13 cm. long, 5.5-6 cm. wide, oblong or oblanceolate, the adaxial margins subalate to alate, densely golden-clavate-puberulous, the carpophores 10-12 mm. long, clavate-puberulous.

LECTOTYPE: *F. Sellow s.n.*, "inter Victoria et Bahia" (fide the original description), Bahia, Brazil (deposited K). The selection of a lectotype is necessary because the holotype was destroyed by fire at the Berlin Herbarium during the last war. The specimen selected was considered to be a duplicate of the original type collection.

Additional Specimens: BRAZIL: Bahia, 1832, *Blanchet* 88 (P), 1039, 1995 (BM, G); Ilheos, prov. Bahia, 1832, *Blanchet* 2362 (G, NY, P); Bahia, Sept. 1839, *Blanchet* 3087a (G), 3088a (G, W); Bahia, *Bondar* 2165 (F); Bahia, *Bondar s.n.* (F); Ilheos, 1839, *Martius* 429 (F, G, GH, MO, NY, P, W); ad ripam Itahypé, Aug. 1822, *Riedel* 620 (A, NY, US); Bahia, 1830, *Salzman s.n.* (G, MO, P). Minas Geraes: 1840, *Claussen* 736 (G). Without locality, *Glocker* 530 (BM).

This very interesting species is known only from the isolated rain forest between Bahia and Ilheos in southern coastal Brazil. Besides its restricted range, it is easily recognizable from any of its near-relatives (*M. bifolium*, *M. angustifolium*, and *M. duckeanum*) by the thick-coriaceous or spongiose nature of the bracts, bracteoles, and sepals. Its pubescence is unique, for magnification reveals that each tiny hair is actually clavate in shape. Such pubescence clothes the inflorescence, the flower parts, and even the mature fruit.

During the preliminary phases of this study, one subspecific taxon was recognized, but the inadequacy of good material to confirm the existence of the few differences has prevented its description. The segregate group, as far as it is possible to determine from the available materials, differs in having punctate leaflets which are usually inequilaterally emarginate at the apex. The following collections exhibit these characters: *Blanchet* 1039, 1995, *Glocker* 530, and *Salzman s.n.*

29. *Macrolobium angustifolium* (Benth.) Cowan, comb. nov. Figure 10.

Vouapa angustifolia Benth. Jour. Bot. & Kew Misc. 2: 239. 1850.

Vouapa chrysostachya Miq. Hollandsche Maatsch. der Wetensch., Haarlem, Natuur. Verhand. (Stirp. Surinam. Select.), ser. 2. 7: 11. 1851.

Macrolobium chrysostachyum (Miq.) Benth. in Mart. Fl. Bras. 15(2): 220. 1870.

Macrolobium chrysostachyum (Miq.) Benth. var. *parviflora* Benth. in Mart. Fl. Bras. 15(2): 220. 1870.

Macrolobium hymenaeifolium Pittier, Bol. Soc. Venez. Ci. Nat. 7: 141. 1941.

Tree 4-30 m. tall, 3-10 dm. in diameter, the branchlets densely pilosulose or less frequently glabrous. *Stipules* 7-11 mm. long, 0.5-1 mm. wide, very rarely persisting through one season, linear or linear-lanceolate. *Petioles* (4-)8-10(-15) mm. long, canaliculate, glabrous or sparsely pilosulose. *Leaflets* (6-)11(-18) cm. long, (2-)3.5(-5.5) cm. wide, falcate or subfalcate, usually lanceolate or elliptic-

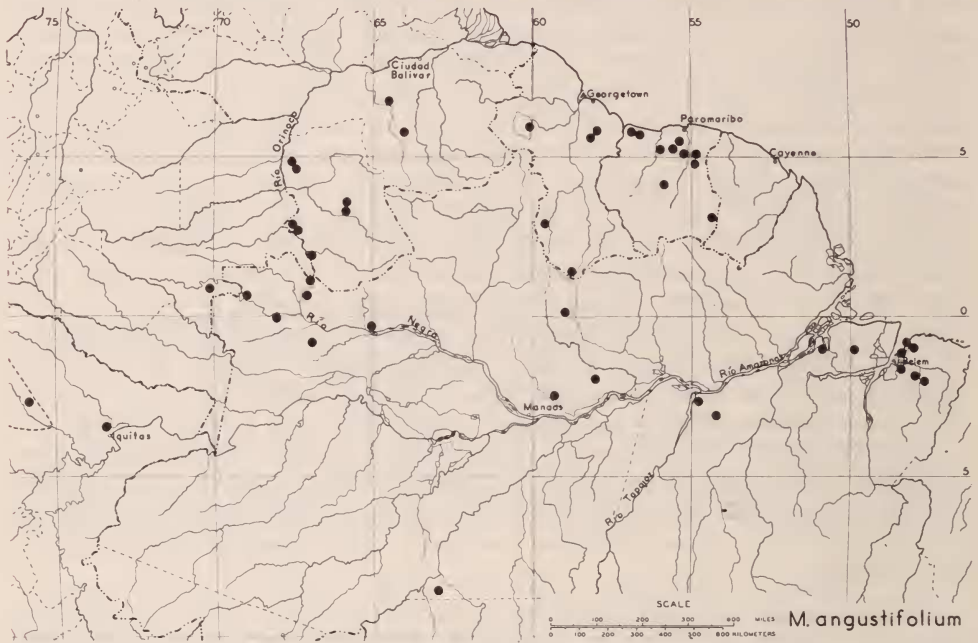


FIG. 10. Geographic distribution of *M. angustifolium*.

to oblong-lanceolate, the base inequilateral, acute, the apex acuminate or caudate-acuminate with a blunt or acute extremity, infrequently bluntly acute, usually conspicuously punctate on the lower surface, glabrous or pilose on the apical-lateral surface of the costa at the junction with the upper side of the leaflet base; costa strongly salient on the upper surface, plane to subsalient beneath, the venules obscure to prominulous. *Inflorescences* to 17.5 cm. long, averaging about 5-8 cm., the axis puberulous to flexuose-pilosulose, the peduncles to 7 mm. long; bracts (3-)5(-10) mm. long, (1.5-)3(-6) mm. wide, semipersistent or caducous, oval, orbicular, ovate, lanceolate or elliptic, acute to acuminate, strigulose within, pilosulose or puberulous externally; pedicels (1-)3(-4.5) mm. long, puberulous to pilosulose; bracteoles (5-)6(-9) mm. long, (2.5-)3(-5) mm. wide, sparsely to strongly strigulose within, puberulous to pilosulose externally, elliptic, oblong, oval, to ovate, oblanceolate or obovate, apiculate to long-acuminate. *Hypanthium* 1-2 mm. long, sessile or with a stipe to 0.5 mm. long, glabrous to puberulous. *Sepals* usually five, free or the adaxial pair more or less united, sometimes totally united

(then sepals four), 1-5.5 mm. long, 1-3 mm. wide, triangular-ovate, lanceolate, or oblong, acute to caudate-acuminate, glabrous or sparingly puberulous on the outer surface on the costa, sparingly ciliolate. *Petal* blade (3.5-)5(-7.5) mm. long, (4-)6(-8.5) mm. wide, usually transversely oval, infrequently suborbicular, the claw (3.5-)5(-7) mm. long, broader to distinctly auriculate basally, glabrous or pilosulose on the base externally and villosulose within up to the center of the blade, ciliolate in the basal half of the claw. *Filaments* (13-)20(-23.5) mm. long, villosulose basally. *Stigma* capitate, peltate-capitate, or infrequently capitellate. *Style* (12-)17(-22.5) mm. long, pilosulose basally. *Ovary* 1.5-3 mm. long, 1-2 mm. wide, oval, oblong, elliptic, or ovate, pilosulose on the margins, the lateral surfaces glabrous, or very rarely laterally pilosulose, 2-ovulate; gynophore 2-4 mm. long, pilosulose, inserted at the top of or midway on the hypanthium wall. *Fruit* 7-11 cm. long, 4-6 cm. wide, usually elliptic or elliptic-obovate, or ovate-elliptic, rarely oblong, glabrous or with a few marginal hairs, the carpophores 7-15 mm. long, sparingly pilosulose. *Seeds* 3-4 cm. long, 2.5-3.5 cm. wide, oval, the crustose testa more or less reticulate-venose.

Type Collection: *R. Spruce 154*, "Caripi," near Pará, Pará, Brazil, Aug. 1849 (HOLOTYPE K, isotype NY, P, W).

Additional Specimens: BRAZIL: *Burchell 9315* and *9950* (GH). Pará: São Miguel do Guamá, near Rios Guamá and Irituia, Aug. 1948, *Dardano & Black 48-3166* (IAN); Faro Macujubim, Sept. 1901, *Ducke 2230* (U); Rio Mapuerá, Dec. 1907, *Ducke 8972* (G); Rio Yamundá, May 1911, *Ducke 11722* (G); Rio Tapajóz, Maria Luisa, July 1923, *Ducke 16940* (U); Furos de Breves, Sept. 1901, *Guedes 2230* (G, US); Rio Capim, June 1897, *Huber 773* (G, US) and *788* (G); Aramá, Breves, March 1900, *Huber 1893* (G); Belém do Pará, June 1901, *Huber* (*H.J.B.R. No.*) *10912* (HAMP No. 2081) (RB); Ilha do Mosqueiro, near Pará, Nov. 1929, *Killip & Smith 30480* (NY, US); Belém do Pará, Nov. 1902, *Sigueira 3004* (G); Igarapé Una, June 1923, *Snehlage 98* (F, GH, US); in vicinibus Pará, July-Aug. 1849, *Spruce s.n.* (G) (this may be an isotype). Matto Grosso: Rio Pacca Nova, affl. Rio Mamoré, Sept. 1923, *Kuhlmann 17666* (U). Amazonas: Upper Rio Negro, Ilha Nova Vida, Feb. 1944, *Baldwin 3438* (US); Rio Urubú between Lindaya and Iracema, Sept. 1941, *Ducke 802* (F, IAN, MO, NY, US); Bas Yapurá, Sept. 1904, *Ducke 6799* (G); Rio Negro, Cucuhy, Igarapé Macacuny, Sept. 1935, *Ducke 35192* (US); Rio Paduirí, Igarapé Castanha, Oct. 1947, *Froes 22519* (NY); Rio Solimões, Igarapé Belém, Dec. 1948, *Froes 23727* (IAN); Rio Tarumá, Manáos, Aug. 1949, *Froes 24980* (IAN); Rio Ipixuna, Municip. Humaytá between Monte Christo and Santa Victoria, Nov. 1934, *Krukoff 7235* (A, F, MO, NY, U, US); Rio Negro, Sept. 1828, *Riedel 1443* (A, BM, NY, US); middle Rio Negro, Vista Alegre, between mouth of Rio Curicuriary and Barcellos, Sept.-Oct. 1947, *Schultes & Lopez 8866* (US); upper Rio Negro, base of Cerro Dimiti, Rio Dimiti, May 1948, *Schultes & Lopez 9922* (US); prope Panure ad "Rio Uaupes," Oct. 1852, *Spruce 2530* (G, GH, K, P, W) (TYPE COLLECTION of *M. chrysostachyum* var. *parviflorum* Benth.).

PERU: Loreto: Gamitanacocha, Río Mazán, Jan.-Feb. 1935, *Schunke 85*, 329 (F, UC, US); upper Río Amazonas, Iquitos, 1924, *Tessmann 3658* (F, G, NY).

COLOMBIA: Capeceras del Cuduyari, Vaupes, Dec. 1943, *Allen 3216* (US).

VENEZUELA: Amazonas: Río Cunucunuma, above Playa Alta, Nov. 1950, *Maguire, Cowan & Wurdack 29495* (F, G, NY), *29501* (NY, US, VEN); Río Cuao, tributary Río Sipapo, Jan. 1949, *Maguire & Politi 28151* (K, NY), *28414* (F, G, K, MO, NY, US, VEN); prope San Carlos del Río Negro, March-April, 1853, *Spruce 2330* (NY); Maroa, Río Guainia, Feb. 1942, *Williams 14403* (F, NY, US, VEN), March 1942, *14805* (F, NY, US, VEN). Bolívar: Río Tonoro, alto Río Paragua, Aug. 1943, *Cordona 813* and *825* (NY, US, VEN); Río Caura, Salto de Pará, March 1939, *Williams 11445* (UC, US, VEN) (TYPE COLLECTION of *M. hymenaeifolium* Pittier).

BRITISH GUIANA: Upper Rupununi R., near Dadanawa, July 1922, *de la Cruz 1799* (F, GH, MO, NY, UC, US); Malali, Demerara R., Oct.-Nov. 1922, *de la Cruz 2643* (F, GH, MO, NY, US); Kamakusa on upper Mazaruni R., Nov. 1922, *de la Cruz 2826a* (GH); Kurupung, upper Mazaruni R., Nov. 1922, *Leng 206* (NY); Kurupung, Tacoba, Nov. 1922, *Lang & Persaud 206* (F); Bootooba, June 1924, *Persaud 34* (F, NY, UC); Bootooba, Demerara R., March 1923, *Persaud 36* (F); Basin of Essequibo R., near mouth of Onoro Creek, Dec. 1937, *A. C. Smith 2698* (A, F, G, MO, NY, U, US, Y).

SURINAM: Pará R., Oct. 1909, *Boldingh 3832* (U); La Prospertu, *Focke 986* (GH, U) (TYPE COLLECTION of *Vouapa chrysostachya* Miq.); fluv. Nickerie, *Fulleken 410* (U);

Litanie, Feti Creek, Aug. 1939, *Geyskes 101* (U); Coppename R., bover Fonchensvallen, Oct. 1943, *Geyskes 978* (U); prope Republiek, Jan. 1911, *Gonggrypp 78* (U); prope Republiek, Aug. 1910, *Gonggrypp s.n.* (U); fluv. Couropina, prope Republiek, Aug. 1911, *Gonggrypp s.n.* (U); *Herb. Surinam 6410* (U); prope Republiek, Oct. 1911, *Kuyper 63* (U); near Posoegronoe, Saramacca R., June 1944, *Maguire 24016* (F, MO, NY, U, US); Toekoemoetoe Creek, Saramacca R., Oct. 1944, *Maguire 24910* (F, MO, NY, U, US); Litanie R., Aug. 1937, *Rombouts 723* (IAN, U); *Splitgerber 81* (P); Litanie, Aug. 1939, *Stabel 101* (NY); Akwansa, Nickerie, Sept. 1916, *Stabel & Gonggrypp 3539* (U, US); Zanderij I, July 1915, *Sur. For. Bur. 761* (U); Zanderij I, Nov. 1915, *Sur. For. Bur. 1383* (U); Zanderij I, Jan. 1916, *Sur. For. Bur. 1565* (U); Watramiri, May 1916, *Sur. For. Bur. 1914* (U); Zanderij I, Aug. 1918, *Sur. For. Bur. 3924* (MO, U); Zanderij I, Nov. 1918, *Sur. For. Bur. 4074* (U); Zanderij I, Sept. 1920, *Sur. For. Bur. 4769* (U); Zanderij I, *Sur. For. Bur. 6410* (U); Zanderij I, Aug. 1924, *Sur. For. Bur. 6472* (MO, U); Zanderij I, May 1944, *Sur. Woodherb. 202* (IAN, NY, U, Y); fluv. 'Pikien, Aug. 1900, *Tresling 260* (U); Surinam, *Weigelt s.n.*; *Wull-schlagel 819* (W); Rio Para, Sept. 1853, *Wullschlagel 1435, 1436, 1437* (W).

FRENCH GUIANA: Guyane, 1821, *Perrottet s.n.* (P).

Vernacular Names: Brazil: "arapary", "ipe". Peru: "machinmango", "soliman". Surinam: "sarabebe", "watrabirihoe", "witte walaba".

There is in this species a very considerable degree of variability but it appears to have no taxonomic significance and certainly no discernible pattern. This situation is rather characteristic of many of the commonly collected, widespread species in the genus. Within these species geographic races may have already arisen but their divergence at this time is insufficient for their taxonomic recognition.

The relationship of this species is surely with *M. bifolium*, with which it has frequently been confused in the past. They are readily separable on the following characters of *M. angustifolium*: (1) ovary pilosulose only on the margins; (2) much larger bracts of different shape; (3) bracts and bracteoles pubescent on the inner surface; (4) costa of leaflets strongly salient on the upper surface.

The replacement of the familiar name of this species by one which is either unknown or poorly known to others may distress those who maintain the sanctity of the well-established epithet. However, the modification is entirely in line with the spirit and letter of the International Code which provides that the earliest epithet shall be the correct one. It has been found that the correct date on Miquel's *Stirpes surinamensis selectae* is really 1851 rather than 1850 as has most frequently been cited. Apparently, the author completed the manuscript in 1850; the introduction is dated January 1850, and his title page bears that date. However, the seventh volume of the second series of the journal cited, which is entirely occupied by Miquel's paper, bears the date 1851. J. K. Hasskarl reviewed the work in *Flora* (34: 190. 28 March 1851.) and he stated there that the publication was received "this week" ("...eines in dieser woche...herausgegebenen Bandes"). This evidence would then establish that the publication in question was published in 1851 during the week of March 28th or possibly somewhat earlier in the year. Consequently, the next available epithet is Bentham's *Vouapa angustifolia*.

30. *Macrolobium retusum* Huber, Bol. Mus. Goeldi 7: 290. 1913.

Tall shrub with glabrous leaves and branchlets. Petioles 5-8 mm. long, shallowly canaliculate. Leaflets 8.5-10.5 cm. long, 5-6.5 cm. wide, obovate-oval, the base inequilateral, the upper side obtuse, the lower acute, the apex round, deeply emarginate; costa salient on both sides, the venules closely parallel, prominent, an intramarginal nerve traversing the length of each margin. Inflorescences 4 cm. long, the axis puberulous; bracts minute, caducous; pedicels about 1 mm. long, puberulous; bracteoles 7.5 mm. long, 3-3.5 mm. wide, oval-oblong, abruptly caudate-acuminate, sparingly strigulose within, puberulous externally. Hypanthium 1.5 mm. long, sessile, glabrous. Sepals five, free, the adaxial pair 1 mm. long, 0.5 mm. wide, triangular, acuminate, ciliolate apically, the other sepals 2.5-3 mm. long, 1-1.5 mm. wide, lanceolate, acuminate, ciliolate apically. Petal blade 3 mm.

long, 4 mm. wide, oval transversely, the claw 7 mm. long, alate but not distinctly auriculate, glabrous externally, sparingly villosulose within on the claw. *Filaments* 15 mm. long, sparsely villose basally. *Stigma* capitellate. *Style* about 12 mm. long, pilose basally. *Ovary* 2 mm. long, 1 mm. wide, oblong, pilose marginally, the lateral surfaces glabrous, 3-ovulate; *gynophore* 1.5 mm. long, pilosulose, inserted at the apex of the hypanthium. *Fruit* unknown.

Type Collection: A. Ducke (H.A.M.P. No.) 12294, "Cerro de Cupati, Río Japura (Caqueta)," Colombia, Nov. 1912 (isotype G).

There are apparently no very intimate bonds of relationship between this species and any of the others of the genus. It has, rather arbitrarily, been placed near the *M. bifolium*-*M. angustifolium* line for lack of a better disposition. It is one of the more distinct species in this section and may be recognized quite readily by the shape of its leaflets, which have deeply emarginate apices, well-developed intramarginal nerves, and closely parallel, prominulous venules.

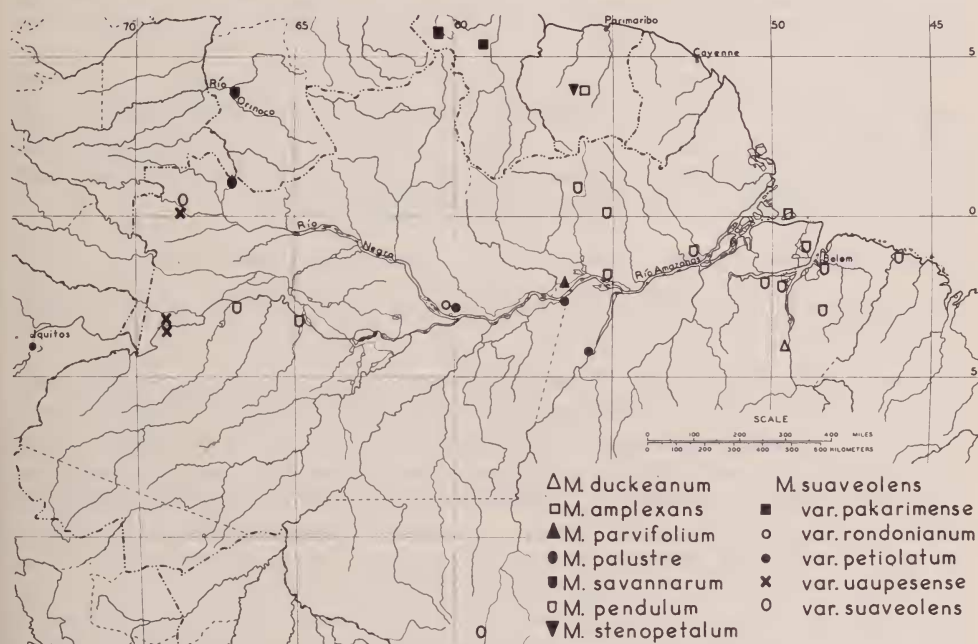


FIG. 11. Geographic distribution of several species of *Macrolobium*.

31. *Macrolobium duckeanum* Cowan, sp. nov. Figure 11.

Arbor (?), ramulis foliisque glabris. Petiolus 10-15 mm. longus, canaliculatus, glaber. Foliola 8.5-11.5 cm. longa, 4-6 cm. lata, valdissime inaequilateralia, arcuata, elliptica, basis inferiore latere auriculato, superiore acuto, ad apicem acuta et extremitate acuta vel obtusa, saepe inaequilaterali; costa saliens, venuli conspicui. Inflorescentiae 3.5-7 cm. longae, axe dense puberulo, pedunculo 2-5 mm. longo; bracteis 2.5 mm. longis, 1.5 mm. latis, caducis, oblongo-ovatis, intus glabris, extus dense puberulis; pedicelli 2.5 mm. longi, dense puberuli; bracteolis 6 mm. longis, 3-4.5 mm. latis, oblongis vel ovalibus, concavis, apiculatis, intus glabris, extus dense puberulis. Hypanthium 2 mm. longum, sessile, glabrum. Sepala quinque, duobus adaxilibus fere omnino conjugentibus, 4.5-5 mm. longa, 1.5-2.5 mm. lata, oblonga, vel ovalia, acuta, concava, irregulariter ciliolata. Petali lamina 5.5 mm. longa, 8 mm. lata, transverse ovalis, unguicilo late alato, petala

ad basim ciliolata et extus pilosula, intus pilosa in unguiculo. Filamenta 11.5-15.5 mm. longa, ad basim villosa. Stigma capitellatum. Stylus 17.5 mm. longus, ad basim puberulus. Ovarium 2 mm. longum, 1 mm. latum, oblongum, puberulum, 2-ovulatum, gynophoro 2 mm. longo, puberulo. Fructus (senes valvae solum) circa 10.5 cm. longus, 4 cm. latus, oblongus, alis angustis, carpophorum 8 mm. longum, minute puberulum. Semina 2.5 cm. longa, 2 cm. lata, ovalia, plana, testa tenui-coriacea, plus minusve venosa.

Type Collection: A. Ducke 15605, "chemin de fer d'Alcobaca, Tocantins, Campina d'Arumatéua," State of Pará, Brazil, Jan. 1915 (HOLOTYPE US, isotype G). Known only by the type collection.

It is with the greatest pleasure that this species is named for Dr. Adolpho Ducke, who has contributed so richly to the knowledge of the flora of northeastern South America by his extensive collections and voluminous writings. He has described a large number of species of *Macrolobium* and his synopsis of the genus in the Amazonian *Hyalea* was quite well done. It is fitting, then, that his name be perpetuated in a species of a genus to which he has given so much of his time and energy.

The collection cited was identified as *M. bifolium* when received for this study. While this is the closest relative of the new species, the latter is readily recognizable by the rotund-auriculate lower side of the leaflet base, its puberulous rather than papillate-puberulous ovary, its transversely oval petal blade, and its minutely puberulous rather than papillate-puberulous fruit.

32. *Macrolobium amplexans* (Amshoff) Cowan, comb. nov. Figure 11.

Macrolobium bifolium (Aubl.) Pers. var. *amplexans* Amsh. Bull. Torrey Club 75: 388. 1948.

Tree to 40 m. tall, 1 m. in diameter, the branchlets very minutely puberulous. Petioles 8-13 mm. long, canaliculate, very minutely puberulous. Leaflets 8.5-17 cm. long, 3-7.5 cm. wide, arcuate, oblong-elliptic, the base inequilateral, acute, the lower side decurrent, the apex truncate-acute, epunctate, minutely puberulous at the base on the upper surface, glabrous beneath; costa plane above, salient beneath, the venules prominulous above, prominent beneath. Inflorescences 3.5-7 cm. long, ramiflorous, the axis minutely puberulous, the peduncles about 2 mm. long; bracts 1 mm. long and wide, triangular, ciliolate, glabrous on the inner surface, minutely puberulous externally; pedicels 2-5 mm. long; bracteoles 6 mm. long, 4 mm. wide, oblong-oval, slightly apiculate, glabrous within, minutely puberulous externally. Hypanthium 1.5 mm. long, glabrous. Sepals four, 3-4 mm. long, 2.5 mm. wide, oval to oblong, obtuse, glabrous. Petal blade 6 mm. long, 7 mm. wide, about orbicular, the claw 4 mm. long, very strongly auriculate basally, the auricles pilosulose externally and ciliolate, villose within on the claw and up to the center of the blade. Filaments villose over most of the surface. Stigma peltate. Style about 15 mm. long, very minutely puberulous basally. Ovary 3 mm. long, 1.5 mm. wide, oblong, minutely puberulous on all surfaces, 2-ovulate, the gynophore 3 mm. long, minutely puberulous, inserted midway on the adaxial wall of the hypanthium. Fruit unknown.

Type Collection: B. Maguire 24308, "high bush north of Savanna I, Tafelberg, Surinam," Aug. 1944 (HOLOTYPE NY, isotypes F, G, MO, U, US). Known only by the type collection.

Miss Amshoff in describing this group as a variety of *M. bifolium* was certainly not far afield, for in many respects obvious similarities do exist. However, it is held that there are ample characters of sufficient magnitude and importance for its elevation to specific rank.

The inflorescences of *M. amplexans* are ramiflorous and are minutely puberulous with simple hairs, whereas those of *M. bifolium* are borne principally on the current year's branchlets and are densely puberulous with ribbon-like hairs. Further, the flowers of the latter are typically densely congested, but in *M. amplexans* they are distant. Also the costa of the leaflets in the latter is not sulcate on the upper surface as it is in *M. bifolium* nor are the venules prominent on the upper surface of the leaflets.

33. *Macrolobium suaveolens* Spruce ex Benth. in Mart. Fl. Bras. 15(2): 219. 1870.

Figure 11.

Tree to 13 m. tall, the branchlets usually glabrous, rarely pilosulose or minutely puberulous. *Petioles* glabrous or minutely puberulous, sulcate to canaliculate. *Leaflets* 7-14 cm. long, 3-5.5 cm. wide, arcuate to falcate, elliptic, the base inequilateral, acute, the apex acute to acuminate, the extremity acute to obtuse; lower surface punctate or epunctate, glabrous, upper surface glabrous or puberulous on the costa and base; costa plane to salient, the venules obscure to prominent. *Inflorescences* 2-8 cm. long, the axis minutely puberulous, the peduncles 1-3 mm. long; bracts 1-1.5 mm. long and wide, triangular or ovate, acute or acuminate, ciliolate, glabrous or infrequently minutely puberulous on the outer surface; pedicels 1-4.5 mm. long, sparsely puberulous or glabrous; bracteoles 5-6.5 mm. long, 2.5-4 mm. wide, oblong or oval, glabrous within or sparingly pilose, minutely puberulous externally, at least at the apex. *Hypanthium* 1-2 mm. long, on a stipe to 1 mm. long or sessile, glabrous or sparsely puberulous. *Sepals* five, free or infrequently the adaxial pair partly united, 1-4 mm. long, 0.5-1.5 mm. wide, lanceolate, linear-lanceolate, oblong or elliptic, or when strongly dimorphic, the adaxial pair triangular and smaller, glabrous or ciliolate near the apex. *Petal* blade 3-7 mm. long, 3.5-7 mm. wide, orbicular to transversely oval, the claw 4-6 mm. long, wider at the base to definitely auriculate, pilose externally toward the base, the claw more or less ciliolate, glabrous within or sparingly villose. *Filaments* 15.5-21 mm. long, villose or villosulose in the basal portion. *Stigma* capitate, capitate, -or peltate. *Style* 10-22 mm. long, glabrous or more often puberulous basally. *Ovary* 1-2.5 mm. long, 1-1.5 mm. wide, oblong or oval, glabrous to minutely puberulous, 2-3-ovulate; gynophore 2-3.5 mm. long, minutely puberulous or pilosulose. *Fruit* unknown.

Key to the Varieties of *Macrolobium suaveolens*

1. Ovary glabrous, adaxial surface of gynophore pilosulose; leaflets with upper margin about straight, lower margin arcuate. 33e. var. *suaveolens*.
1. Ovary minutely puberulous on all surfaces or only on margins with lateral surfaces glabrous; both margins of leaflets arcuate. 2.
2. Ovary puberulous on all surfaces. 3.
2. Ovary puberulous only on margins. 4.
3. Leaflets epunctate on lower surface, minute-puberulous above at base and on most of length of strongly salient costa, petioles densely minutely puberulous. Potaro River region of central British Guiana. 33a. var. *pakarimense*.
3. Leaflets punctate on lower surface, glabrous, costa plane to salient on upper surface, petioles glabrous. Central Brazil. 33b. var. *rondonianum*.
4. Bracteoles more or less pilose within; petioles mostly 7-13 mm. long. 33c. var. *petiolatum*.
4. Bracteoles glabrous on inner surface; petioles 3.5-6 mm. long. 33d. var. *uaupesense*.

33a. *Macrolobium suaveolens* var. *pakarimense* Cowan, var. nov. Figure 11.

Arbor 10-13 m. alta, 15 cm. diametro, ramulis minute puberulis. Petiolus 4-6 mm. longus, leviter sulcatus, valde minuto-puberulus. Foliola 7-9.5 cm. longa, 3-4 cm. lata, arcuata, ad apicem abrupte acuta, extremitate obtusa vel acuta, supra in costa minute puberula, infra glabra, costa valde salienti supra, infra plana,

venulis subprominulis. Inflorescentiae ad 5 cm. longae; pedicello 2.5-4 mm. longo; bracteolis 5.5 mm. longis, 3 mm. latis, oblongis, intus glabris, extus minuto-puberulis, obtusis et parce apiculatis. Sepala quinque, duobus adaxilibus partim conjunctis, 3.5-4 mm. longa, 1-1.5 mm. lata, lanceolata vel lineari-lanceolata, ad apicem sparse ciliolata. Petali lamina circa 7 mm. diametro, orbicularis, unguicilo 4-5 mm. longo, auriculato. Stylus 14-15 mm. longus, basim versus puberulus. Ovarium 2 mm. longum, 1 mm. latum, ubique minuto-puberulum, gynophoro 3.5 mm. longo, minuto-puberulo.

Type Collection: *B. Maguire & D. B. Fanshawe* 32210, "margin of Imbaimadai Savanna, Upper Mazaruni River, Pakarima Mts., 550 m. alt., British Guiana," Oct. 1951 (HOLOTYPE NY, isotypes F, G, GH, K, MO, U, US, VEN).

Additional Specimens: Bartica-Potaro Road, 107 m., Nov. 1943, *Fanshawe* 1470 (Forestry Dept. 4206) (BGF).

33b. *Macrolobium suaveolens* var. *rondonianum* (Hoehne) Cowan, comb. nov. Figure 11.

Macrolobium Rondonianum Hoehne, Comm. Linh. Teleg. Ann. 5, Bot. pt. 8: 32. 1919.

Tree with glabrous branchlets and leaves. Petioles 4-5 mm. long. Leaflets 9.5-13 cm. long, 3.5-5 cm. wide, arcuate, acute to long-acuminate, the extremity usually obtuse, punctate on the lower surface, the venules prominent above, prominent to prominent beneath. Inflorescences 2-4.5 cm. long; bracts triangular, acute, glabrous except for the ciliolate margins or very minutely puberulous externally; pedicels 1-2.5 mm. long, glabrous or sparsely and minutely puberulous; bracteoles 5.5-6 mm. long, 2.5-3.5 mm. wide, oblong, glabrous within, sparsely and minutely puberulous outside, at least near the apex. Sepals 1.5-3 mm. long, 0.5-1.5 mm. wide, more or less ciliolate. Petal blade 3-4.5 mm. long, 3.5-4.5 mm. wide, transversely oval, the claw 4-4.5 mm. long, exauriculate. Filaments 17-17.5 mm. long, sparsely villose basally. Stigma capitellate to capitate. Style 14.5 mm. long, basally minutely puberulous. Ovary 2 mm. long, 1-1.5 mm. wide, minutely puberulous on all surfaces, the gynophore 2.5 mm. long, minutely puberulous.

Specimens Examined: BRAZIL: Amazonas: Estrada do Aleixo, Manáos, May 1937, *Ducke* 489 (A, F, MO, NY, US); same data, *Ducke* 35195 (U, US); Rio Uaupés, Taraqua, Nov. 1947, *Pires* 984 (IAN); Rio Uaupés, Panure, Nov. 1947, *Pires* 1077 (IAN).

Although no authentic material of Hoehne's species has been examined, it appears probable from his published plate and description that his species is identical with this variety. Accordingly the epithet is retained in a new combination. The type material is probably at the Museo Goeldi but material of this genus has not been received from that institution.

33c. *Macrolobium suaveolens* var. *petiolatum* Cowan, var. nov. Figure 11.

Arbor mediocris 10 m. alta, ramulis foliisque glabris. Petiola 7-13 mm. longa, canaliculata. Foliola 8-14 cm. longa, 2.5-5.5 cm. lata, arcuata ad falcata, ad apicem acuminata vel acuta et extremitate acuta vel obtusa, punctata vel epunctata, costa valdissime salienti supra, infra plana ad subsalienti, venulis prominulis ad prominentibus. Inflorescentiae 3.5-8 cm. longae, pedunculo 1.5-3 mm. longo; bracteis 1-1.5 mm. longis et latis, triangularibus, glabris, marginibus ciliolatis exceptis; pedicelli 2-4.5 mm. longi, minute puberuli; bracteolis 5-6.5 mm. longis, 3-4 mm. latis, oblongis vel ovalibus, plus minusve pilosis intus, extus puberulis. Sepala adaxilia 1.5-2 mm. longa, 1 mm. lata, triangularia, cetera 2.5-3.5 mm. longa, 1-2 mm. lata, lanceolata ad oblonga, acuta vel acuminata, plus minusve ciliolata vel glabra. Petali lamina 3.5-5.5 mm. longa, 4-5.5 mm. lata, orbicularis vel transverse ovalis, unguicilo 4-6 mm. longo. Filamenta 15.5-18 mm. longa, villosa basim versus. Stigma capitellatum ad peltatum. Stylus 10-16 mm.

longus, glaber vel basim versus puberulus. Ovarium 1.5-2.5 mm. longum, 1-1.5 mm. latum, oblongum, marginibus minute puberulis, lateribus glabris, 2-3-ovulatum, gynophoro 2-3.5 mm. longo, minute puberulo.

Type Collection: *A. Ducke* 35194, "silva terris altis ad meridiem Paraná do Ramos, Parintins," Amazonas, Brazil, Jan. 1936 (HOLOTYPE US, isotype G, U).

Additional Specimens: Rio Tarumá, Manáos, Amazonas, Brazil, Jan. 1941, *Ducke* 1012 (IAN, NY, US); Bella Vista, Rio Tapajóz, Pará, Brazil, Jan. 1918, *Ducke* 10913 (H.A.M.P. No. 16912) (G, P, U, US); Mishuyacu, near Iquitos, Dept. Loreto, Peru, Dec. 1929, *Klug* 717 (F, NY, US).

There is but slight variability in the aspect of the specimens cited above, but *Ducke* 1012 shows several characteristics which are at definite variance with the rest of the material. In spite of this it is assigned here, but its characters are not incorporated in the description. It has pilosulose branchlets, shorter petioles, and longer adaxial sepals.

33d. *Macrolobium suaveolens* var. *uaupesense* Cowan, var. nov. Figure 11.

Arbor parva, ramulis glabris. Petiolus 3.5-6 mm. longus, glaber. Foliola 8-14 cm. longa, 3-5 cm. lata, subfalcata ad falcata, ad apicem abrupte acuminata vel longo-acuminata, glabra, costa subsalienti, venulis obscuris ad subprominulis. Inflorescentiae 2-4 cm. longae, pedunculo circa 1.5 mm. longo; bracteis caducis, circa 1 mm. longis, 1 mm. latis, triangularibus; pedicelli 2-2.5 mm. longi; bracteolis 5-6 mm. longis, 3-4 mm. latis, oblongis vel ovalibus, ad apicem rotundatis apiculatisque, glabris intus, extus minuto-puberulis. Sepala adaxilia 1-2 mm. longa, 0.5-1 mm. lata, triangularia, acuta vel acuminata, cetera 2.5-3.5 mm. longa, 1-1.5 mm. lata, lanceolata vel elliptica, acuta, glabra vel ad apicem ciliolata. Petali lamina 3.5-5.5 mm. longa, 5-6.5 mm. lata, transverse ovalis vel suborbicularis, unguicilo 4-7 mm. longo, nonnihil auriculato. Filamenta 19.5-21 mm. longa. Stigma capitellatum. Stylus 16.5-22 mm. longus, glaber vel ad basim puberulus. Ovarium 1.5-2.5 mm. longum, 1 mm. latum, oblongum, 2-ovulatum, marginibus puberulis, lateraliter glabris, gynophoro 2-2.5 mm. longo, minute puberulo.

Type Collection: *R. Schultes* & *J. Pires* 9069, "Taruacá, Igarapé da Chuva, Rio Vaupés between Ipanore and confluence of Rio Negro, Amazonas," Brazil, Nov. 1947 (HOLOTYPE US).

Additional Specimens: BRAZIL: Amazonas: São Paulo de Olivença, Rio Solimões, Nov. 1940, *Ducke* 358 (Y) and Oct. 1931, *Ducke* 24065 (RB, US); Rio Uaupés, Taraqua, Nov. 1947, *Pires* 995 (IAN).

33e. *Macrolobium suaveolens* var. *suaveolens*. Figure 11.

Vouapa suaveolens (Spruce ex Benth.) Taub. Bot. Centralbl. 47: 394. 1891.

Vuapa suaveolens (Spruce ex Benth.) Kuntze, Rev. Gen. 1: 213. 1891.

Shrub to 5 m. tall or small tree, the branchlets and leaves glabrous. Petioles 5-6 mm. long. Leaflets 8-11.5 cm. long, 3-4 cm. wide, falcate, the apex acuminate with the extremity obtuse, the upper margin nearly straight, the lower arcuate; costa plane above, salient beneath, the venules prominulous. Inflorescences 4.5-6.5 cm. long, the peduncle about 1 mm. long; bracts 1.5 mm. long, 1 mm. wide, ovate, acuminate, glabrous except for the ciliolate margins; pedicels 1-3.5 mm. long, sparsely and minutely puberulous; bracteoles 5-6 mm. long, 3-3.5 mm. wide, oblong, minutely apiculate, glabrous within, externally minutely puberulous at least on the apex and costa. Sepals dimorphic, the adaxial ones 1-1.5 mm. long, about 1 mm. wide, triangular, acute, the others 2.5 mm. long, 1.5 mm. wide, oblong-lanceolate, acute, glabrous. Petal blade about 4 mm. in diameter, orbicular, the claw 4 mm. long, broader at the base but not auriculate. Filaments 16 mm. long. Stigma peltate. Style 11 mm. long, glabrous. Ovary 2 mm. long, 1 mm. wide, glabrous, oblong, the gynophore 2.5 mm. long, pilosulose on the adaxial surface.

Type Collection: R. Spruce 2771, "In sylvis 'Caatingas'...fluv. Uaupés," Brazil, Nov. 1852 (HOLOTYPE K, isotypes F, G, GH, NY, P, W).

Additional Specimens: Rio Negro, Vila Içana, April 1947, *Pires* 450 (IAN).

The relationships of this species are not particularly well defined but it is perhaps more nearly related to *M. amplexans* than to any other species. It may be distinguished by its minutely puberulous branchlets, ramiflorous inflorescences, and four-parted calyx.

The prime character utilized in segregating the varieties is the distribution of the pubescence on the ovary. The ovary of varieties *pakarimense* and *rondonianum* is puberulous on all surfaces, while that of varieties *petiolatum* and *uaupesense* is puberulous only on the margins, and the ovary of the typical variety is completely glabrous.

34. *Macrobium parvifolium* (Huber) Cowan, comb. nov. Figure 11.

Macrobium suaveolens Spruce ex Benth. var. *parvifolium* Huber, Bol. Mus. Goeldi 5: 389. 1909.

Small shrub, the branchlets minutely puberulous. *Petioles* circa 4 mm. long, canaliculate, glabrous. *Leaflets* 4-7 cm. long, 1.5-2.5 cm. wide, glabrous, epunctate, inequilateral, arcuate, oval-elliptic or lanceolate, the base inequilateral, subobtruse, the lower side rotund, the apex abruptly or evenly acute, the extremity obtuse or acute; costa subsalient, the venules obscure. *Inflorescence* 4-14 cm. long, the axis minutely puberulous with the basal portion invested by closely imbricate, persistent, sterile bracts; bracts 2 mm. long, 1-2 mm. wide, ovate, ciliate, glabrous within, minutely puberulous externally; bracteoles 4.5 mm. long, 2.5 mm. wide, oblong, apiculate, glabrous within, minutely puberulous externally. *Hypanthium* 1 mm. long, glabrous, sessile. *Sepals* five, free, glabrous, the adaxial pair 0.5-1 mm. long, 0.5-0.7 mm. wide, triangular, acute, the others 2.5-3 mm. long, 1-1.5 mm. wide, lanceolate, acute, or acuminate. *Petal* blade 4.5 mm. long, 6 mm. wide, transversely oval, the claw 2.5 mm. long, auriculate, pilosulose externally and ciliate on the auricles, sparsely villosulose within on the claw and up to the center of the blade. *Filaments* 11.5 mm. long, villose in the basal part. *Stigma* capitate. *Style* 12 mm. long, glabrous. *Ovary* 2 mm. long, 1 mm. wide, oblong, glabrous, 2-ovulate, the gynophore 2 mm. long, glabrous. *Fruit* unknown.

Type Collection: A. Ducke 8497, "campos a E. de Faro," Pará, Brazil, July 1907 (HOLOTYPE presumably at Museo Goeldi, isotypes F-frag., G, US). Material of this genus has not been received for study from the Museo Goeldi.

Additional Specimens: Faro, Pará, Brazil, May 1911, *Ducke* 11697 (G).

Macrobium parvifolium was originally described as a variety of *M. suaveolens*, to which it is undoubtedly rather closely allied, but there are so many differences that it deserves specific recognition. The most striking feature of the plant is the densely bracteate base of the inflorescence axis, and it is this characteristic which most readily separates it from any part of *M. suaveolens*, as well as from other species. Its glabrous ovary distinguishes it from all the varieties of *M. suaveolens* except the typical one. Its leaflet shape and size, glabrous gynophore, and shape of the petal blade serve to differentiate it from the latter.

35. *Macrobium palustre* Ducke, Arch. Inst. Biol. Veg. Rio de Janeiro 4: 13. 1938.

Figure 11.

Small tree, the branchlets glabrous. *Leaves* unijugate to bijugate; the petioles 13-18 mm. long, canaliculate; rachis 0-22 mm. long, canaliculate, glabrous. *Leaflets* 6.5-9.5 cm. long, 3-4 cm. wide, glabrous, epunctate, slightly arcuate, elliptic, the base inequilateral, acute, the apex acute with a rounded-truncate extrem-

ity; costa subimpressed on the upper surface, salient beneath, the venules prominent. *Inflorescences* to 7 cm. long, glabrous, the peduncles 5-6 mm. long; pedicels 6-8 mm. long, glabrous; bracteoles 10-11 mm. long, 5 mm. wide, oblong and cuspidate or elliptic and acute, glabrous, coriaceous. *Hypanthium* 2 mm. long on a stipe about 1 mm. long, glabrous. *Sepals* four, 7-8 mm. long, 2.5-3 mm. wide, lanceolate or oblong-lanceolate, acute, slightly concave, ciliolate in the apical portion. *Petal* blade 6 mm. long, 7.5 mm. wide, transversely oval, the claw 5-6 mm. long, auriculate basally, glabrous externally, ciliolate on the lower portion of the claw, villose within on the claw and up to the center of the blade. *Filaments* 16.5 mm. long, villose basally. *Stigma* capitate. *Style* 13 mm. long, glabrous. *Ovary* 2.5 mm. long, 1.5 mm. wide, oblong, glabrous, 1-2-ovulate, the gynophore 2.5-3 mm. long, glabrous, inserted midway on the adaxial hypanthial wall. *Fruit* unknown.

Type Collection: A. Ducke (H.J.B.R. No.) 35193, "Igarapé Macacury, Rio Negro, Cucuhy," Amazonas, Brazil, September 1935 (HOLOTYPE RB, isotypes G, P, U, US).

Macrolobium palustre is obviously related to *M. pendulum* but differs in so many characters, both quantitative and qualitative, that it has been regarded as specifically distinct, although the first reaction was to treat it as a variety within *M. pendulum*. In addition to differing by the frequent occurrence of bijugate leaves, *M. palustre* has caducous stipules, longer petioles, longer sepals and petal claw, and basally villose filaments. Also, whereas *M. pendulum* is distributed along the lower basin of the Amazon River, this species is known only from the upper Rio Negro region.

36. *Macrolobium savannarum* Cowan, sp. nov. Figure 11.

Arbuscula ad 1 m. alta, ramulis minute et sparse puberulis. Stipulae caducae, 2 mm. longae, 0.5 mm. latae, subulatae, acuminatae, sparsissime ciliolatae. Petiolus 1.5-4 mm. longus, minute puberulus. Foliola 1.5-5.5 cm. longa, 1-2.5 cm. lata, inaequilateraliter subfalcato-elliptica, ad basim inaequilateralia, latere inferiore obtuso sed superiore acuto, ad apicem acuta et extremitate obtusa, glabra, epunctata; costa leviter salientis, venulis utroque conspicuis. Inflorescentiae 1.5-3 cm. longae, glabrae, pedunculo 1-2 mm. longo; bracteis caducis; pedicellis 5-15 mm. longis, glabris; bracteoli 9-11 mm. longi, 4-7 mm. lati, oblongi, obovati vel oblongo-obovati, glabri, apiculati, intus carnosissimi. Hypanthium 1.5-2 mm. longum, glabrum. Sepala quattuor, 4-8 mm. longa, 1.5-4 mm. lata, oblonga vel lanceolata, ad apicem eroso-dentata, glabra. Petali lamina 6-7.5 mm. longa, 6.5 mm. lata, orbicularis, unguiculo 5-8 mm. longo, alato, haud auriculato; 1-4 petalodia 4-7.5 mm. longa, linearia vel lineari-oblongata. Filamenta 13.5-15.5 mm. longa, glabra. Stigma capitellatum. Stylus 10-13.5 mm. longus, glaber. Ovarium 2-2.5 mm. longum, 1-1.5 mm. latum, oblongum, glabrum, (2-)3-ovulatum, gynophoro 2-2.5 mm. longo, glabro. Fructus ignotus.

Type Collection: B. Maguire, R. Cowan, & J. Wurdack 30540, "Yapacana Savanna, base of Cerro Yapacana, Río Orinoco," Amazonas, Venezuela, Jan. 1951 (HOLOTYPE NY, isotypes F, G, K, MO, U, US).

Additional Specimens: Same data, Maguire, Cowan & Wurdack 30505 (IAN, NY, VEN).

This new species is most nearly related to *M. pendulum* but there are several very distinct differences separating them. *M. savannarum* has caducous stipules, epunctate leaflets, and it is a low shrub of southwestern Venezuela. *M. pendulum* has persistent stipules, often punctate leaflets, and it is a tree 8-20 m. tall in the Amazon Delta region and southern Amazonas in Brazil.

This species was the dominant shrub in the open wet savanna where it was growing but was not found in the semi-savanna areas nearer the river. The soil of

the savanna was pure white quartz sand and at the time the specimens cited were collected it was covered by six to eight inches of water.

37. *Macrolobium pendulum* Willd. ex Vogel, *Linnaea* 11: 412. 1837. Figure 11.

Macrolobium racemigerum Tulasne, Arch. Mus. Par. 4:174. 1844.

Vouapa pendula (Willd. ex Vogel) Taub. Bot. Centralbl. 47: 394. 1891.

Vuapa pendula (Willd. ex Vogel) Kuntze, Rev. Gen. 1: 212. 1891.

Vuapa racemigera (Tul.) Kuntze, Rev. Gen. 1: 212. 1891.

Tree 8-20 m. tall, the branchlets very minutely puberulous or rarely glabrous. *Stipules* 5-12 mm. long, 0.5-1.5 mm. wide, persistent, linear to falcate-linear, ciliolate, acuminate. *Petioles* 4-12 mm. long, canaliculate, glabrous or very minutely puberulous on the upper surface; rachis rudiment 4.5-10.5 mm. long, persistent, acicular. *Leaflets* 5.5-11.5(-15) cm. long, 2-5(-6) cm. wide, arcuate-elliptic, the base inequilateral, acute, the apex acute with obtuse extremity, glabrous or sparingly and very minutely puberulous at the base of the upper surface, sometimes punctate beneath; costa plane above, salient beneath, the venules prominulous to prominent. *Inflorescences* 7-10.5 cm. long, glabrous, pendent, the peduncles 3-6 mm. long, the flowers distant, the buds lanceolate, acuminate; bracts 1.5-2 mm. long, 1-1.5 mm. wide, caducous, oblong, acute, glabrous except for the ciliolate margin; pedicels 7-12 mm. long; bracteoles 8.5-10.5 mm. long, 2-4.5 mm. wide, lanceolate, acuminate, glabrous or sometimes sparsely puberulous within at the base. *Hypanthium* 1-2 mm. long, sessile or on a 0.5 mm. long stipe, glabrous. *Sepals* four, 3.5-6 mm. long, 1-3.5 mm. wide, oblong, elliptic or lanceolate, the adaxial one obtuse, the others acute or acuminate, glabrous except for the tufted-ciliate apices. *Petal* blade 4.5-5 mm. long, 6.5-7.5 mm. wide, transversely oval, the claw 2.5 mm. long, auriculate basally, glabrous externally, villosulose within on the claw and into the throat of the blade. *Filaments* 11.5-21 mm. long, glabrous. *Stigma* usually simple. *Style* 14-19.5 mm. long, glabrous. *Ovary* 2-3 mm. long, 1-1.5 mm. wide, elliptic to oblong, glabrous, 2-ovulate; gynophore 3-3.5 mm. long, glabrous, inserted at the apex of the adaxial wall of the hypanthium. *Fruit* 6-8 cm. long, 4-5.5 cm. wide, oval, glabrous, the carpophores 6-7 mm. long, glabrous. *Seeds* 1-2 per fruit, about 3.5 cm. long, 3 cm. wide, oval, the testa crustose, venose.

Specimens Examined: BRAZIL: Pará: Belém, Aug. 1948, *Addison s.n.* (IAN); South Forest of I. A. N., Belém, Dec. 1942, *Archer* 7956 (IAN); Rio Guamá, São Miguel, Aug. 1948, *Dardano & Black* 48-3066 and 48-3085 (IAN); Arrayollos, April 1903, *Ducke* 3523 (G); Rio Cumina, Nov. 1907, *Ducke* 8889 (G); upper Rio Ariramba, Dec. 1910, *Ducke* 11321 (G); Rio Cumina, bas Trombetas, Dec. 1910, *Ducke* 11475 (G); alto Rio Ariramba, Oct. 1913, *Ducke* 14959 (G); Lago Curumun, Obidos, *Ducke* 15310 (BM, G); Arrayollos, regione Almeirim, April 1923, *Ducke* 16934 (U); Maranhão, Assutina-Carutapera, Sept.-Dec. 1940, *Froes* 11951 (NY, US); Ile Mexiana, Sept. 1901, *Guedes* 2375 (G); Broganca, Dec. 1899, *Huber* 1710 (US); Ilha das Onças, Belém, Sept. 1903, *Huber* 3842 (G); Rio Acará, Thomé Assú, Dist. Acará, Aug. 1931, *Mexia* 6050 (F, G, GH, MO, NY, U, UC, US); Pará, 1929, *Moss* 38 (US); "regionis Amazonicae indigenum, juxta Egam...", *Poeppig* 2889 (F, G, P) (TYPE COLLECTION of *M. racemigerum* Tul.); Cameta, Sept. 1903, *Siqueira* 3795 (G); Belém, grounds of I. A. N., Jan. 1944, *Silva* 42 (IAN). Amazonas: Fozdo Jutahy, Nov. 1927, *Ducke* 20314 (RB); Municip. Humaytá, near Tres Casas, Sept.-Oct. 1934, *Krukoff* 6162 (A, BM, F, MO, NY, U, US).

Although the type of this species has not been available for study, Vogel's description leaves no doubt of the identity of the group. Apparently he adopted an herbarium name of Willdenow's, supplied it with a description, and attributed it to the latter.

This is one of the most distinct species of this section and is not likely to be confused with any other group. The persistent stipules and rachis rudiment alone are important distinguishing characters, but the pendent racemes of widely sep-

arated flowers are also distinctive. These characters serve to differentiate it from its relatives *M. palustre* and *M. savannarum*.

38. *Macrolobium stenopetalum* Amshoff, Bull. Torrey Club 75: 389. 1948. Figure 11.

Shrub 1.5-3 m. tall to small tree 10 m. tall, the branchlets and leaves glabrous. *Petioles* 3-6 mm. long, canaliculate. *Leaflets* 4-10 cm. long, 1.5-2.5 cm. wide, inequilateral, strongly falcate, lanceolate, the base inequilateral, acute, the apex acute to acuminate, punctate on the lower surface; costa plane to impressed on the upper surface, salient beneath, the venules prominulous to prominent. *Inflorescences* 3-5.5 cm. long, glabrous, the peduncles 5-6.5 mm. long; bracts 1 mm. long and wide, persistent, triangular, acute, ciliolate; pedicels 5-8.5 mm. long; bracteoles 8-13.5 mm. long, 3-5 mm. wide, oblong to lanceolate, apiculate to acuminate, glabrous. *Hypanthium* 3-4 mm. long, sessile or with a stipe to 0.5 mm. long, glabrous. *Sepals* four, 6-9.5 mm. long, 1.5-4 mm. wide, oblong, oblong-lanceolate, or lanceolate, acute, glabrous except for the ciliolate apices. *Petal* 7-12.5 mm. long, 2-2.5 mm. wide near the apex, spatulate, pilosulose externally and ciliolate at the base, villose within on the lower portion, the claw not distinct. *Filaments* 18.5-22.5 mm. long, villose toward the base. *Stigma* capitellate. *Style* 15-20 mm. long, glabrous to sparsely puberulous basally. *Ovary* 3 mm. long, 1.5 mm. wide, oblong, glabrous to sparingly puberulous on the margins, the lateral surfaces glabrous, 2-ovulate; gynophore 3-5 mm. long, glabrous to sparsely and minutely puberulous, inserted at the margin of the adaxial hypanthial wall. *Fruit* 10 cm. long, 4 cm. wide, oblong, the carpophores about 13 mm. long, sparsely and minutely puberulous basally. *Seed* 2 cm. in diameter, suborbicular, flat, the membranous testa sparsely venulose.

Type Collection: *B. Maguire* 24792, "Savanna No. IV, Tafelberg," Surinam, Sept. 1944 (HOLOTYPE NY, isotypes F, U, US).

Additional Specimens: Savanna No. II, Tafelberg, Surinam, Aug. 1944, *Maguire* 24232 (F, MO, NY, U, US); Savanna No. IV, Surinam, Aug. 1944, *Maguire* 24375 (F, NY, U, US).

This species exhibits, perhaps, the greatest affinity with *M. pendulum* but even this relationship is rather remote. It differs from the latter in the shape of its leaflets, its caducous stipules, its very different petal form, and the length of its hypanthium, which may be as much as twice as long. The lack of a well-delimited claw to the petal blade is particularly striking and especially interesting because its form approaches that of sect. *Stenosolen*.

39. *Macrolobium stenosphon* Harms, Repert. Nov. Sp. 3: 51. 1906. Figure 12.

Pseudouvouapa stenosphon (Harms) Britton & Killip, Ann. N. Y. Acad. 35: 166. 1936.

Tree 10-15 m. tall, 6 dm. in diameter, the branchlets glabrous. *Stipules* 17-25 mm. long, 3-9 mm. wide, foliaceous, persistent through one season, falcate-elliptic, acuminate, minutely ciliolate, otherwise glabrous. *Leaves* oblong, 20-30-jugate, the pairs (4-)5-9(-12) mm. apart. *Petioles* (7-)10(-15) mm. long, canaliculate, uncinat-puberulous in the canal; rachis (11-)18(-24.5) cm. long, uncinat-puberulous or puberulous on the upper surface, glabrous beneath. *Leaflets* 20-30 mm. long, 3-10 mm. wide, lanceolate, each leaflet somewhat arcuate toward the leaf apex, acuminate or infrequently acute, mucronate, the base inequilateral, the upper side rounded and obtuse to subcordate, the lower side acute; margin densely appressed-sericeous in a narrow band on the upper surface; costa plane to salient, the venules closely parallel, prominulous. *Inflorescences* 5-8 cm. long, ramiflorous, glabrous, sessile; pedicels 4-7 mm. long, glabrous; bracteoles 15.5-20 mm. long, 6-7.5 mm. wide, elliptic, acute to acuminate, glabrous on the outer surface, more or less puberulous within. *Hypanthium* 18-24 mm. long, on a stipe 1.5-2.5 mm. long, glabrous, gibbous at the base on the abaxial side, widening toward the

apex. *Sepals* 18-22 mm. long, 3-6.5 mm. wide, oblong, obtuse, glabrous or sparsely ciliate. *Petal* blade 30-40 mm. long, 14-18 mm. wide, oblanceolate, pilosulose within on the costa in the basal portion, the claw 3-4 mm. long, puberulous toward the base externally, pilosulose within; 1-3 petalodia sometimes present, linear, acute. *Filaments* 30-35 mm. long, villosulose basally, the anthers 5.5-6 mm. long, 2-2.5 mm. wide. *Stigma* capitellate to capitate. *Style* 32-34 mm. long, glabrous. *Ovary* 5-7.5 mm. long, 1.5-2 mm. wide, oblong, glabrous, (4-)6-8-ovulate, the free portion of the gynophore 4.5-6.5 mm. long, glabrous. *Fruit* (immature) 11 cm. long, 2.5 cm. wide, oblong narrowly, glabrous, the carpophores 33 mm. long, glabrous.

LECTOTYPE: *F. C. Lehmann* 8987, "häufig an den Ufern der Flüsse Timbiqui und Micay, 0-400 m.," Colombia, 1899 (deposited NY, fragmentary islectotype F). The holotype was on deposit at the Berlin Herbarium but it is assumed that it was destroyed in the disastrous fires which occurred there during the last war. The director of that institution has informed us that there is no material of this genus in their herbarium. The New York sheet bears only two flowers but abundant vegetative material. A note on this sheet in Britton's hand states that the specimen in the Kew Herbarium is undetermined, indicating that Harms did not annotate that sheet nor is the New York sheet annotated by him.

Additional Specimens: COLOMBIA: Dept. del Valle: Río Yurumanguí entre Isla de Golondro y la Amargura, Feb. 1944, *Cuatrecasas* 16041 (US); Río Cajambre, Quebrada de Ordóñez, May 1944, *Cuatrecasas* 17267 (US); Río Colima, Quebrada de la Brea, May 1946, *Cuatrecasas* 21298 (F). Dept. del Chocó: La Concepción, 15 km. east of Quibdó, May 1931, *Archer* 1954 (NY, US); headwaters Río Tutunendo, east of Quibdó, May 1931, *Archer* 2196 (NY, US); south of Río Condoto, between Quebrada Guarapo and Mandinga, April 1939, *Killip* 35431 (US); Novitá, *Triana* 4418 (NY, US).

ECUADOR: Prov. Esmeraldas: Selva Alegre up Río Santiago to Playa de Oro, *Little* 6393 (NY).

Vernacular Names: "chiparo dormilon," "dormilon."

Of the specimens cited, only *Killip* 35431, a sterile collection, is in need of further comment. It may represent a new species closely related to *M. stenosiophon* or it may be a distinct subspecific taxon within the latter. The following characters are discordant with the rest of the material: (1) branchlets pilosulose; (2) stipules linear, 8.5 mm. long, 1 mm. wide; (3) 35-43 pairs of leaflets on a rachis 14-15 cm. long; and (4) leaflets 12-22 mm. long, 2-5 mm. wide. It is cited here in spite of these differences, but its characters are not included in the description of the species.

This species with *M. trinitense* and *M. colombianum* forms a distinct line of relationship. The latter two are obviously related but *M. stenosiophon* is so utterly different from either that it must stand alone, with no known close relatives. It is readily separable from the other two species by its larger number of leaflet pairs, the shape of its leaflets and by the marginal sericeous band on the upper surfaces of the latter. It also has a much longer hypanthium, calyx, and petal than the other two species.

40. *Macrolobium colombianum* (Britton & Killip) Killip, *Caldasia* 4: 213. 1946.

Figure 12.

Shrub or tree to 15 m. tall, the branchlets glabrous, pilose, pilosulose, or pilosulose and puberulous. *Stipules* 5-25 mm. long, 1.5-8 mm. wide, persistent for at least one season, foliaceous or not, subulate-lanceolate or narrowly to broadly elliptic, acute, acuminate, or caudate-acuminate, falcate or straight, glabrous or more or less pilosulose or puberulous externally, the inner surface glabrous or pilosulose toward the base. *Leaves* 5-13-jugate, the pairs 6-22 mm. apart. *Petioles* 2-15 mm. long, subulate-canaliculate, pilose, pilosulose, puberulous, or pilosulose and puberulous; rachis 4-14 cm. long, puberulous on the upper surface, most

of the hairs uncinatae, the wings glabrous beneath, the axis glabrous, pilose, or pilosulose beneath. *Leaflets* 9-72 mm. long, 4-20 mm. wide, oblong to elliptic or lanceolate-oblong, the base inequilateral, the lower side obtuse, the upper acute to obtuse, the apex obtuse, emarginate, often apiculate; upper surface puberulous on the costa, beneath glabrous to pilosulose on the costa and often on the basal part of the blade; costa plane to impressed on the upper surface, salient beneath, the venules obscure to prominulous. *Inflorescences* 2.5-9 cm. long, the axis minutely puberulous or glabrous, the peduncles 0-6 mm. long; bracts 2 mm. long, 1 mm. wide, lanceolate, glabrous within, puberulous at the base externally; pedicels 2.5-6.5 mm. long, glabrous or puberulous; bracteoles 5-9 mm. long, 2.5-4 mm. wide, oblanceolate or obovate, glabrous or more or less puberulous externally, glabrous or sparsely appressed-puberulous within. *Hypanthium* 5-8 mm. long, glabrous to sparingly puberulous, on a stipe 0.5-2.5 mm. long. *Sepals* 6-11 mm. long, 2-6 mm. wide, oblong to elliptic or obovate, glabrous or ciliolate. *Petal* sessile or subsessile, 15-25 mm. long, 7-13 mm. wide, elliptic, glabrous or basally villose on the outer surface, villose within on the costa in a broad band. *Filaments* 12-35 mm. long, villose in the basal part, the anthers 2.5-3 mm. long, 1.5-2 mm. wide. *Stigma* capitellate, or capitate. *Style* 15-27.5 mm. long, pilose or pilosulose basally. *Ovary* 2.5-3 mm. long, 1.5 mm. wide, oblong, oblong-elliptic or oblong-oblanceolate, 3-5-ovulate, the margins pilosulose or pilose, the lateral surfaces glabrous, pilosulose, or puberulous; free portion of the gynophore 2.5-4 mm. long, pilose or pilosulose. *Fruit* 10.5-11.5 cm. long, 3.5-4 cm. wide, oblong, the margins pilosulose and the lateral surfaces glabrous, or puberulous on all surfaces, the carpophores 4-12 mm. long, pilosulose. *Seeds* 2-2.5 cm. long, 2 cm. wide, obovate to suborbicular.

Key to the Varieties of *Macrolobium colombianum*

1. Ovary and fruit pubescent only on margins. 4.
1. Ovary and fruit pubescent on all surfaces. 2.
2. Leaflets lanceolate-oblong, 12-13 pairs, 12-26 mm. long, 7-10 mm. wide; carpophores 4-5 mm. long. Northeastern Venezuela. 40a. var. *monagasense*.
2. Leaflets oblong, fewer, usually larger; carpophores 9-12 mm. long. Northern Venezuela and Colombian Andes. 3.
3. Leaves 7-10-jugate; stipules 15-25 mm. long. Eastern foothills of Colombian Andes. .. 40b. var. *metaense*.
3. Leaves 5-8-jugate; stipules 8.5-15 mm. long. Northern coastal range of Venezuela. ... 40c. var. *ocumarensis*.
4. Stipules 25 mm. long, 5 mm. wide, foliaceous, falcate-fusiform; leaves 6-13-jugate, petioles 2-6 mm. long; inflorescence 3.5-5 cm. long, axis puberulous, pedicels 3-3.5 mm. long, puberulous. 40d. var. *bicuspidum*.
4. Stipules 5 mm. long, 1.5 mm. wide, nonfoliaceous, subulate-lanceolate; leaves 5-6-jugate, petioles 10-15 mm. long; inflorescence 7-9 cm. long, axis glabrous, pedicels 5-6.5 mm. long, glabrous. 40e. var. *colombianum*.

40a. *Macrolobium colombianum* var. *monagasense* Cowan, var. nov. Figure 12.

Arbor, ramulis pilosulis. Folia oblonga, 12-13-jugata, paribus 6-8 mm. separatis. Petiolus 5-8 mm. longus, puberulus, sulcatus; rachis 5.5-7 cm. longa, supra uncinato-puberula, infra pilosula. Foliola 12-26 mm. longa, 7-10 mm. lata, lanceolato-oblonga, pari inferiore ovali, in costa supra puberula, infra basim versus pilosula. Flores non vidi. Fructus oblongus, ubique puberulus, carpophoro 4-5 mm. longo, pilosulo et puberulo, semina circa 2 cm. diametro, suborbicularia.

Type Collection: J. Steyermark 61841, "forested southwest-facing slopes of Cerro Negro, above La Sabana de las Piedras, northwest of Caripe, alt. 1500 meters," State of Monagas, Venezuela, April 1945 (HOLOTYPE F, isotype VEN). Known only by the type collection.

40b. *Macrolobium colombianum* var. *metaense* Cowan, var. nov. Figure 12.

Arbuscula ad 2.5 m. alta vel arbor 5-6 m. alta, ramulis pilosis. Stipulae 15-25 mm. longae, 4-8 mm. latae, foliaceae, falcatae, ellipticae, acuminatae. Folia obovata vel oblanceolata, 7-10-jugata, paribus 6-15 mm. separatis. Petioli 3-7 mm. longi, pilosi; rachis 7-12 cm. longa, supra uncinato-puberula, infra alis glabris, axe piloso. Foliola (13-)20-55 mm. longa, (4-)8-20 mm. lata, oblonga, costa puberula supra, infra plus minusve pilosula. Inflorescentiae 2.5-5.5 cm. longae, terminales, sessiles; bracteis 2 mm. longis, 1 mm. latis, intus glabris, extus ad basim puberulis; pedicelli 2.5-5 mm. longi, puberuli; bracteolae 6-9 mm. longae, 3-4 mm. latae, ovaes ad obovatae, extus plus minusve puberulae, intus glabrae. Hypanthium 5-8 mm. longum, stipite ca. 1 mm. longo, puberulum. Sepala (6-)8-12 mm. longa, (2-)4-6 mm. lata, ad apicem sparse ciliolata, oblonga ad elliptica vel obovata. Petalus 20-25 mm. longus, 8.5-13 mm. latus, sessilis vel unguicilo 2-2.5 mm. longo. Filamenta 30-35 mm. longa, basim versus villosula, antherae 2.5-3 mm. longae, 1.5-2 mm. latae. Stigma capitellatum. Stylus 20-27.5 mm. longus, basim versus pilosulus. Ovarium 3 mm. longum, 1-1.5 mm. latum, oblongum, lateraliter puberulum vel pilosulum, gynophoro 4 mm. longo, pilosulo. Fructus elongato-oblongus, marginibus puberulis, carpophoro 10 mm. longo, pilosulo.

Type Collection: R. Jaramillo, D. Mesa, et al. 412, "Acacias, Intendencia del Meta," Colombia, Aug. 1946 (HOLOTYPE US).

Additional Specimens: COLOMBIA: Meta: Los Llanos, Villavicencio toward El Parrao, Nov. 1938, *Cuatrecasas* 4607 (US); Quebrada Negra, near Villavicencio, Jan. 1939, *Haught* 2555 (F, NY, US); Acacias, Aug. 1946, *Uribe* 1359 (US).

40c. *Macrolobium colombianum* var. *ocumarensense* Cowan, var. nov. Figure 12.

Arbor 4-5 m. alta, ramulis pilosulis. Stipulae 8.5-15 mm. longae, 3.5-6.5 mm. latae, foliaceae, falcatae, ellipticae, acutae. Folia plus minusve obovata, 5-8-jugata, paribus 7-22 mm. separatis. Petioli 4-15 mm. longi; rachis 4-14 mm. longa, petiolis et rachibus uncinato-puberulis supra, infra glabris vel plus minusve pilosulis. Foliola 9-52 mm. longa, 5-24 mm. lata, oblonga vel elliptico-oblonga, costa supra dense puberula, lamina glabra vel ad basim puberula, in costa infra basim versus pilosula; costa plana vel sparse impressa supra. Flores non vidi. Fructus 11.5-12 cm. longus, 4 cm. latus, oblongus, apicem versus latior, puberulus, carpophoro 9-12 mm. longo, semina 2.5 cm. longa, 2 cm. lata, obovata.

Type Collection: H. Pittier 12164, "En las selvas pluviales inferiores de los valles de Ocumare, Aragua, 500-800 m.," Venezuela, April 1926 (HOLOTYPE VEN, isotype US).

Additional Specimens: VENEZUELA: Carabobo, upper Guaremales, road from Puerto Cabello to San Felipe, July 1920, *Pittier* 8971 (US, VEN); Perico, road from Caracas to La Guajira, *Pittier* 8971a (VEN).

Vernacular Names: "grifo negro," "roso picure."

The last collection cited above bears the number 8971 but since this number was also assigned to another collection it is here referred to as 8971a to distinguish the two collections.

40d. *Macrolobium colombianum* var. *bicuspidum* (Pittier) Cowan, comb. nov. Figure 12.

Macrolobium bicuspidum Pittier, Bol. Soc. Venez. Ci. Nat. 7: 140. 1941.

Tree 12-15 m. tall, the branchlets pilosulose and puberulous, the hairs often uncinata. *Stipules* 25 mm. long, 5 mm. wide, foliaceous, falcate-fusiform, acuminate, ciliolate, pilosulose on the costa. *Leaves* oblong-oblanceolate or obovate, 6-13-jugate, the pairs 8-12 mm. apart. *Petioles* 2-6 mm. long, pilose, sometimes also puberulous; rachis 6-13.5 cm. long, uncinata puberulous on the upper sur-

face, the wings glabrous beneath, the axis more or less pilose. *Leaflets* 13-44 mm. long, 8-15 mm. wide, the basal pair oval, the others oblong; puberulous on the costa above, puberulous on the costa and sometimes also on the basal portion of the blade beneath. *Inflorescences* 3.5-5 cm. long, axillary or terminal, the peduncle 1-2 mm. long; pedicels 3-3.5 mm. long, puberulous; bracteoles 5-5.5 mm. long, 2.5 mm. wide, oblanceolate, externally puberulous basally and on the costa, glabrous within. *Hypanthium* 5 mm. long on a 1 mm. stipe, sparingly puberulous. *Sepals* 6-7 mm. long, 2-3 mm. wide, oblong, glabrous. *Filaments* about 12 mm. long, basally pilose. *Ovary* oblong-elliptic, pilose marginally, the lateral surfaces glabrous, 4-ovulate; free portion of the gynophore 2.5 mm. long, pilose. *Fruit* (immature) oblong, wider toward the apex, the margins sparsely pilosulose, the carpophores about 10 mm. long; seeds 4.

Type Collection: E. Delgado 299, "Camino antiguo de Caracas a La Guaira, D. F.," Venezuela, July-Nov. 1939-40 (HOLOTYPE VEN, isotypes F, US).

Additional Specimens: COLOMBIA: Cordillera Oriental, Dept. Norte de Santander, Sarrare region, confluence of Ríos Cubugon & Cobaría, Nov. 1941, *Cuatrecasas* 13204 (COL, US).

40e. *Macrolobium colombianum* var. *colombianum*. Figure 12.

Outea "(?)" *colombiana* Britton & Killip, Ann. N. Y. Acad. 35: 166. 1936.

Branchlets glabrous or the very young ones sparsely pilosulose. *Stipules* 5 mm. long, 1.5 mm. wide, subulate-lanceolate, acuminate, persistent, sparsely puberulous on the outer surface. *Leaves* 5-6-jugate, the pairs 12-20 mm. apart. *Petioles* 10-15 mm. long, subulate-canaliculate; rachis 6.5-9 cm. long, the rachis and petioles puberulous on the upper surface, glabrous beneath. *Leaflets* 33-72 mm. long, 12-18 mm. wide, elliptic or oblong-elliptic, densely puberulous above on the costa, glabrous beneath, the venules prominulous. *Inflorescences* 7-9 cm. long, the axis glabrous, the peduncles 2-6 mm. long, sparsely and minutely puberulous; pedicels 5-6.5 mm. long, glabrous; bracteoles 8 mm. long, 4 mm. wide, oblanceolate, glabrous externally, sparsely appressed-puberulous within. *Hypanthium* 4.5-5 mm. long, on a stipe 2.5 mm. long, glabrous. *Sepals* 7 mm. long, 2.5-3 mm. wide, oblong, rotund-obtuse, glabrous. *Corolla* and *androecium* unknown. *Stigma* capitellate. *Style* about 15 mm. long, pilosulose basally. *Ovary* 2.5 mm. long, 1.5 mm. wide, oblong-oblanceolate, the margins densely pilosulose, the lateral surfaces glabrous, 3-4-ovulate; free portion of the gynophore 3 mm. long, pilosulose. *Fruit* unknown.

Type Collection: J. Triana 4419, "Istmo de S^a. Pablo, Nouvelle-Grenade.-Prov. de Choco, hauteur 70 metr.," March 1853 (HOLOTYPE NY, isotypes BM, COL, US). Known only by the type collection.

The only near relative of this rather complex species is certainly *M. trinitense*, although there is a very remote connection with *M. stenosiphon*. *M. colombianum* is set off from its nearest relative by its leaves having a greater number of pairs of differently shaped leaflets, by its more or less pubescent ovary, and by the geographic distribution.

The varieties composing this species are based primarily on the distribution of the ovary pubescence, number of pairs of leaflets per leaf, shape of the leaflets, size and shape of the stipules, and the geographic distribution. Var. *monagasense*, with its numerous pairs of lanceolate-oblong leaflets and pubescent ovary, is not particularly closely related to either var. *metaense* or var. *ocumataense*, its nearest relatives. These latter varieties also have pubescent ovaries and/or fruit and differ from one another in the number of leaflet pairs, size of the stipules, and geographic distribution.

The glabrous ovary of the typical variety and var. *bicuspidum* serve to differentiate them from the other taxa of the same rank. Quite a number of characters separate them from each other. The more important of these are the size and nature of the stipules, number of leaflet pairs, petiole length and presence or absence of pubescence on the inflorescence.

41. *Macrolobium trinitense* Urban, Symb. Ant. 1: 314. 1899.

Tree to 25 m. tall, 4 dm. in diameter, the branchlets very minutely puberulous but glabrescent. Leaves 2-4-jugate, the petioles 5-18 mm. long, canaliculate, the rachis (1.5-)3-8 cm. long, the petiole and rachis uncinata-puberulous on the upper surface, glabrous beneath. Leaflets 43-85 mm. long, 15-45 mm. wide, elliptic, the base inequilateral, the upper side subcordate, the lower acute, the apex subacuminate to acuminate, the extremity truncate, entire or slightly retuse; costa plane to subsalient on the upper surface, salient beneath, the venules prominulous. Inflorescences 4-11 cm. long, cauliflorous, fasciculate, the axis glabrous, the peduncle 5-12 mm. long; pedicels 6-15 mm. long, filiform, glabrous; bracteoles 8-9 mm. long, 3.5 mm. wide, oblong-ob lanceolate, glabrous. Hypanthium 5.5-6 mm. long, on a stipe about 1.5 mm. long, glabrous. Sepals 5-7.5 mm. long, 2.5-3.5 mm. wide, oblong, elliptic, or obovate, obtuse. Petal subsessile, the blade 10-15 mm. long, 7.5-9.5 mm. wide, oval to ovate, the claw 0.5-1.5 mm. long, glabrous on the outer surface, villosulose within on the lower portion of the costa. Filaments 12.5-18 mm. long, villosulose in the lower portion, the anthers 3 mm. long, 1.5-2 mm. wide. Stigma capitellate. Style about 10 mm. long, glabrous. Ovary 2.5 mm. long, 1.5 mm. wide, oblong, glabrous, 3-4-ovulate, the free portion of the gynophore 1-3 mm. long, glabrous. Fruit unknown.

Type Collection: W. E. Broadway (Trinidad Bot. Gard. Herb. No.) 5216, Tucuche, Trinidad, Jan. 1893 (HOLOTYPE presumably at Trinidad Herbarium, isotype NY).

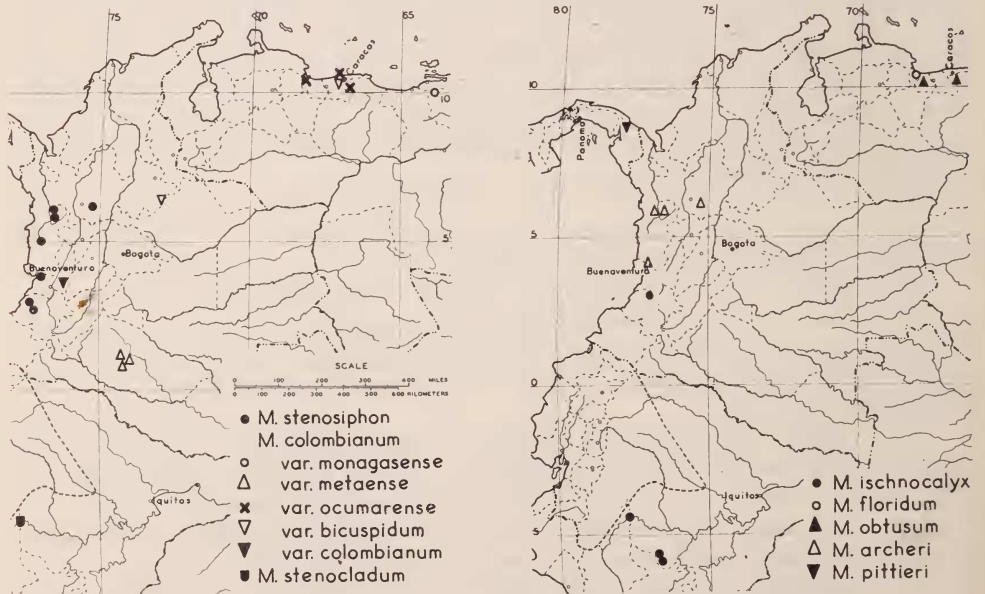


FIG. 12. Geographic distribution of most of the species of section *Stenosolen*.

Additional Specimens: El Tucuche, Trinidad, Oct. 1943, *Beard* 149 (A, U).

This species is closely allied to *M. colombianum* and especially to the typical variety of that species. It is amply distinct from *M. colombianum* by its long filiform and glabrous pedicels, its cauliflorous inflorescences, by its elliptic leaflets being in only two to four pairs, and by the geographic distribution.

42. *Macrolobium stenocladum* Harms, Notizbl. 9: 969. 1926. Figure 12.

Tree 8-10 m. tall, 15 cm. diameter, the branchlets minutely puberulous. *Stipules* 3 mm. long, 0.5 mm. wide, persistent, subulate, acuminate, weakly ciliolate. *Leaves* glabrous except for the petioles, the latter 2.5-5 mm. long, broadly canaliculate, minutely puberulous, the rachis vestige to 2 mm. long, linear. *Leaflets* 6.5-10 cm. long, 2.5-5 cm. wide, sessile, elliptic, the base inequilateral, acute, the apex obtusely acute, the costa impressed on the upper surface, salient beneath. *Inflorescence* to 3 cm. long, the axis minutely puberulous; pedicels 2-6 mm. long, minutely puberulous; bracteoles 8-8.5 mm. long, about 3.5 mm. wide, oblanceolate, the apex rounded and slightly apiculate, glabrous except for minute hairs at the apex. *Hypanthium* 6.5 mm. long, on a stipe 2 mm. long, sparsely and minutely puberulous. *Sepals* 11-12.5 mm. long, 3-4.5 mm. wide, oblanceolate, acute, the abaxial one strongly concave, glabrous except for the ciliolate margins. *Petal* blade about 20 mm. long, 10 mm. wide, more or less ovate, the claw 3 mm. long, poorly delimited, glabrous externally, the claw ciliolate sparsely, villose within on the costa and over the center of the blade. *Filaments* glabrous, the anthers (in bud) 3 mm. long, 1 mm. wide. *Style* puberulous basally. *Ovary* 3 mm. long, 1 mm. wide, more or less fusiform, densely and minutely puberulous on all surfaces, 4-ovulate; free portion of the gynophore about 1.5 mm. long, densely and minutely puberulous. *Fruit* unknown.

LECTOTYPE: *G. Tessmann* 4091, mouth of Río Santiago, upper Rio Marañón, 160 m., East Peru, Sept. 1924 (deposited G, isoelectotypes F-frag., NY, US). Known only by the type collection.

As with *M. stenosiphon*, the selection of a lectotype is necessitated by the destruction of the holotype at the Berlin Herbarium in fires during the last war.

Macrolobium stenocladum is perhaps most closely related to *M. ischnocalyx* but the connection is rather tenuous. It differs from the latter by having much smaller, sessile leaflets, sepals of different form, and the lateral surfaces of the ovary puberulous rather than granular-puberulous as in *M. ischnocalyx*.

43. *Macrolobium ischnocalyx* Harms, Notizbl. 9: 968. 1926. Figure 12.

Low tree 3-5 m. tall, about 15 cm. diameter, the branchlets very minutely puberulous. *Leaves* with petioles 2-5 mm. long, sulcate to canaliculate, very minutely puberulous; petiolules 2-4 mm. long, canaliculate-alate, very minutely puberulous. *Leaflets* 13.5-33 cm. long, 3.5-12 cm. wide, equilateral, elliptic, the base equilateral, acute, decurrent, the apex acuminate with the extremity blunt or acute; upper surface glabrous, very minutely and sparsely puberulous on the costa beneath; costa salient on both surfaces but more strongly so beneath, the venules obscure to prominent on the upper surface, prominulous to prominent beneath. *Inflorescences* 3.5-9.5 cm. long, cauliflorous, the axis very minutely puberulous, the peduncles 3-5 mm. long; bracts 1.5 mm. long, 1 mm. wide, caducous, triangular, acuminate, ciliolate, glabrous within, very minutely puberulous externally; pedicels 2.5-5 mm. long; bracteoles 9-13 mm. long, 4-6 mm. wide, oblong-oblanceolate, the apex rounded and slightly apiculate, glabrous within, minutely puberulous externally. *Hypanthium* 6-11 mm. long, on a stipe 2.5-5.5 mm. long, both minutely puberulous. *Sepals* 10.5-15 mm. long, 3-5.5 mm. wide, oblong, obtuse, glabrous within, very minutely puberulous outside, ciliolate. *Petal* blade 20-28

mm. long, 8-13 mm. wide, lanceolate, the claw 4-6 mm. long, glabrous or sparingly villosulose within on the lower part of the costa; one petalodium sometimes developed, 15.5-17.5 mm. long, 2-5 mm. wide, linear or oblanceolate-spatulate, acute or obtuse. *Filaments* 32-38 mm. long, glabrous, the anthers 4-4.5 mm. long, 2 mm. wide. *Stigma* capitate. *Style* about 20 mm. long, minutely puberulous at the base. *Ovary* 2-4.5 mm. long, 1-2 mm. wide, oblong, densely puberulous on the margins but only sparingly and minutely granular-puberulous on the lateral surfaces, 4-5-ovulate; free portion of the gynophore 1.5-3.5 mm. long, minutely puberulous. *Fruit* unknown.

Type Collection: *G. Tessmann* 4265, upper Marañón, mouth of the Río Santiago, 160 m., Peru, Oct. 1924 (fragment of HOLOTYPE F; a Tessmann collection without collection number or data is deposited at NY and may be an isotype).

Additional Specimens: Balsapuerto, Dept. Loreto, Peru, Jan. and May 1933, *Klug* 2863, 3046 (A, F, G, GH, MO, NY, US); Veneral, Rio Yurumanguí, Dept. del Valle, Colombia, Jan.-Feb., *Cuatrecasas* 15752 (F).

This species, while exhibiting some relationship to *M. stenocladum*, is probably much more nearly allied to *M. modicopetalum*. From the latter *M. ischnocalyx* maybe separated by its longer pedicels, bracteoles, hypanthium, sepals and petal. Also, the sepals of this species are puberulous on the outer surface and its ovary is minutely granular-puberulous laterally.

The collection from Colombia is referred here with some reservation, for it exhibits certain characteristics which do not conform with the bulk of the material of this species. It appears to be a glabrous form, as the characteristic puberulence of the hypanthium, sepals, and leaflet costa is lacking or nearly lacking.

44. *Macrolobium modicopetalum* Schery, Ann. Mo. Bot. Gard. 30: 88. 1943.

Tree 3-10 m. tall, the branchlets very minutely puberulous. *Petioles* 5-12 mm. long, canaliculate, very minutely puberulous; petiolules usually present, to 4 mm. long, minutely puberulous. *Leaflets* 14.5-26 cm. long, 5-9 cm. wide, equilateral, elliptic, the base equilateral to inequilateral, acute, decurrent, the apex acuminate to long-acuminate, the margin sometimes irregularly undulate; glabrous except on the costa base on one or both surfaces, minutely punctate; costa salient on both surfaces, the venules obscure to prominulous above, prominulous to prominent beneath. *Inflorescence* 7-9 cm. long, cauliflorous, the axis very minutely puberulous, the peduncle 3-4 mm. long; pedicels 0.5-1 mm. long; bracteoles 5.5-7.5 mm. long, 2.5-3.5 mm. wide, obovate, the apex rotund, sometimes slightly apiculate, glabrous within, very minutely puberulous externally. *Hypanthium* 3-4 mm. long, on a stipe 0.5-1 mm. long, glabrous. *Sepals* 5-8.5 mm. long, 1-3.5 mm. wide, oblong, obtuse, somewhat concave, glabrous or minutely ciliolate apically. *Petal* 11.5-13.5 mm. long, 5-7.5 mm. wide, lanceolate, sessile, basally pilosulose externally, villose within in a broad band on the basal two-thirds of the costa. *Filaments* 13.5-14.5 mm. long, sparsely pilosulose basally, the anthers 2.5 mm. long, 2 mm. wide. *Stigma* simple or slightly swollen. *Style* ca. 15 mm. long, puberulous basally. *Ovary* 2.5 mm. long, 1 mm. wide, oblong to oblanceolate, appressed-puberulous on the margins, glabrous laterally or very rarely totally glabrous, 3-ovulate; free portion of the gynophore 1-2 mm. long, minutely puberulous or rarely glabrous. *Fruit* unknown.

Type Collection: *H. von Wedel* 2226, "Fish Creek, vicinity Chiriquí Lagoon, Provincia de Bocas del Toro," Panama, April 1941 (HOLOTYPE MO, isotypes GH, US).

Additional Specimens: Rio Dagua, Colombia, *Lehmann* 1129 (K); same locality as the type, April and May 1941, *von Wedel* 2209 (GH, MO, US), 2291 (GH, MO), and 2399 (MO, US).

The collection from Colombia, *Lehmann 1129*, must certainly be assigned here but it exhibits sufficient differences that it may well represent a new subspecific taxon within this species. Unfortunately, it is only in bud and is not adequate for critical study. It differs from the rest of the material cited in having a glabrous ovary and the sepals are sparsely puberulous on the inner surfaces.

This northernmost representative of the genus finds its nearest relative in western Peru in *M. ischnocalyx*, from which it differs in a number of respects: (1) it has shorter pedicels, bracteoles, and hypanthium; (2) its sepals are smaller and are glabrous or at most ciliolate minutely at the apex; (3) the ovary is glabrous on the lateral surfaces and the petal is sessile and smaller.

45. *Macrobium floridum* Karsten, Fl. Columb. 1: 151. 1861. Figure 12.

Large tree with glabrous branchlets and leaves, the petioles 4-6 mm. long. *Leaflets* 25-30 cm. long, 8-11 cm. wide, sessile, oblanceolate-elliptic, the base inequilateral, the lower side rotund-subcordate, the upper acute, the apex bluntly acute; costa salient, the primary veins prominulous above, prominently salient beneath, the venules prominulous. *Inflorescence* about 5-15 cm. long, peduncle 3.5 mm. long, the axis minutely puberulous; bracts 2-3 mm. long and wide, oval, acute, glabrous within, puberulous externally. *Hypanthium* 9-12 mm. long, on a stipe 2 mm. long. *Sepals* 10-13 mm. long, 3-7 mm. wide, elliptic-oblong, obtuse apically, glabrous within, puberulous externally. *Petal* blade 27-35 mm. long, 15-18 mm. wide, elliptic-oblong, the claw about 3 mm. long, pilosulose basally on the costa. *Filaments* 40-45 mm. long, glabrous, the anthers 5 mm. long, 2 mm. wide. *Stigma* subcapitate. *Style* about 35 mm. long, short-pilosulose. *Ovary* about 3 mm. long, 1 mm. wide, oblong, short-pilosulose marginally, laterally puberulous, 5-ovulate; free portion of the gynophore about 2 mm. long, pilosulose. *Fruit* unknown.

Type Collection: Karsten *s.n.*, "Cordillera littoralis Venezuelae prope Puerto Cabello in silva humida, umbrosa montis, 'Cumbre chiquita' appelati, altitudinē 200 metr.," Aragua, Venezuela (HOLOTYPE presumably at Leningrad, isotype W).

As far as may be judged, this species is most closely related to *M. archeri* of western Colombia. *M. floridum* is set apart from its nearest relative by its acute leaflets, longer inflorescences, shorter sepals, and pubescent hypanthium.

46. *Macrobium obtusum* Pittier, Bol. Soc. Venez. Ci. Nat. 7: 142. 1941. Figure 12.

Tree to 12 m. tall, the branchlets and leaves glabrous. *Petioles* 3-5 mm. long. *Leaflets* 17-30 cm. long, 7-16 cm. wide, sessile, equilateral, broadly elliptic-oval or oblanceolate, the base inequilateral, acute on the upper side, broadly rounded-obtuse on the lower side, the apex broadly rounded-obtuse; costa plane to subsalient on the upper surface, salient beneath, the venules prominulous to obscure above, prominulous to prominent beneath. *Inflorescences* 3.5-9.5 cm. long, terminal on the old branchlets or lateral on old wood, the axis very minutely puberulous; bracts 1-1.5 mm. long and wide, triangular, caducous, or persistent, glabrous within, sparsely and minutely puberulous externally, sometimes minutely ciliolate; pedicels 1.5-4 mm. long, very minutely puberulous; bracteoles 8-11 mm. long, 4-6 mm. wide, oval or elliptic-obovate, the apex rotund, glabrous within, sparsely and very minutely puberulous externally. *Hypanthium* 6.5-9.5 mm. long, on a stipe 1-1.5 mm. long, both minutely puberulous. *Sepals* 10-13 mm. long, 2.5-7 mm. wide, oblong or oblong-oval, obtuse, sometimes apiculate, carnosé-coriaceous, ciliolate, glabrous within, very minutely puberulous outside. *Petal* blade 20 mm. long, 6 mm. wide, narrowly elliptic, the claw 3 mm. long, glabrous externally, villose within on the costa. *Filaments* 35 mm. long, sparsely villosulose toward the base, the anthers 6.5 mm. long, 3.5 mm. wide. *Stigma* slightly swollen. *Style* 22.5-23 mm. long, puberulous basally. *Ovary* 2-3 mm. long, 1.5 mm. wide,

oblong, puberulous on the margins, laterally glabrous, 4-ovulate; free portion of the gynophore 2 mm. long, minutely puberulous. *Fruit* unknown.

Type Collection: *H. Pittier* 13975, "Selvas inferiores del valle de Ocumare (Parque nacional) 600 m.," Aragua, Venezuela, April 1937 (HOLOTYPE VEN, isotype US).

Additional Specimens: VENEZUELA: Prope coloniam Tovar, between Valencia and Campanero, July or March 1857, *Fendler* 2474 (GH); Parque Nacional, between Rancho Grande and Maracay, Aragua, Dec. 1943, *Steyermark* 54963 (F, MO, VEN).

Macrobium obtusum is perhaps most closely allied to *M. floridum* which was described from this same general area of Venezuela. However, *M. obtusum* may be distinguished by the broadly rounded leaflet apices, by its smaller bracts and petal and by its generally shorter hypanthium.

47. *Macrobium archeri* Cowan, sp. nov. Figure 12.

Alta arbor vel gracile arbustum 5 m. altum, ramulis glabris vel microscopico-puberulis. Folia glabra; petiolus 2-6 mm. longus, subsulcatus ad canaliculatus, glaber vel minute puberulus. Foliola 21.5-50 cm. longa, 6-11 cm. lata, subaequilateralialia, elliptica, ad basim inaequilateralialia, latere superiore acuto et inferiore rotundato-obtusum, ad apicem acuminata et extremitate obtusa vel acuta, infra punctata; costa salienti sed infra validiore, venulis obscuris ad prominulis. Inflorescentiae ca. 3.5 cm. longae, terminales, axe minutissime puberulo; bracteis 3 mm. longis, 1.5-2 mm. latis, persistentibus, triangulari-ovatis, acuminatis, ciliolatis, intus glabris, extus minuto-puberulis; bracteolae 17 mm. longae, 6.5 mm. latae, obovatae, rotundato-obtusae, coriaceae, concavae, intus glabrae, extus sparse minutissimeque puberulae vel glabrae. Hypanthium 14 mm. longum, stipite 4.5 mm. longo, glabrum, carnosum. Sepala 20-22 mm. longa, 4.5-7 mm. lata, oblonga, obtusa, concava, carnosocoriacea, glabra. Petalus 28 mm. longus, 12 mm. latus, lanceolatus, sessilis, glaber. Filamenta 27 mm. longa, basim versus pilosa, antherae oblongae, 9-10 mm. longae, 2.5 mm. latae. Stigma capitatum. Stylus ca. 21 mm. longus, glaber. Ovarium 5-7 mm. longum, 2 mm. latum, oblongum, marginibus sparse puberulis sed lateraliter glabrum, 5-ovulatum, gynophori parte libera 5 mm. longa. Fructus ignotus.

Type Collection: *W. A. Archer* 2020, "Intendencia del Choco: Quibdó, Río Atrato; altitude about 60 meters," Colombia, April-May 1931 (HOLOTYPE US, fragmentary isotype NY).

Additional Specimens: COLOMBIA: Río Atrato, Quibdó, Intend. del Choco, April-May 1931, *Archer* 2023 (US); Río Calima (region del Choco), La Trojita, 5-50 m. alt., Feb.-March 1944, *Cuatrecasas* 16309 (F); Córdoba, valley of Río Dagua, Dept. El Valle, Oct. 1922, *Killip* 11852 (NY, US); south of Río Condoto, between Quebrada Guarapo and Mandinga, Intend. El Choco, April 1939, *Killip* 35433 (US); Puerto de Buenaventura, April 1833, *Triana* s.n. (COL); Port de Buenaventura, 1851-57, *Triana* s.n. (P).

Both morphologically and geographically the nearest relative of this species is the Panamanian species *M. pittieri*. The sessile petal of *M. archeri* is much smaller than that of its relative; it has a very much stouter hypanthium, which is longer; its bracteoles are considerably larger and puberulous on the outer surface; the leaflet apex of *M. archeri* is bluntly acuminate but it is caudate-acuminate in *M. pittieri*. All these differences add up to a marked series of distinctions between the two species.

All the material cited above had been identified previously as *M. floridum*, which, while closely related, is quite different, judging from the meagre data available. *M. floridum* exhibits the following differences: (1) acute leaflet apices rather than acuminate; (2) a longer inflorescence; (3) sepals about 10 mm. long as compared to 20 mm.; and (4) a pubescent hypanthium.

The new species is named in honor of the collector of the type material, W. A. Archer, Curator of the Herbarium of the Bureau of Plant Industry at Beltsville, Maryland, and collector of note in northern South America.

48. *Macrolobium pittieri* (Rose) Schery, Ann. Mo. Bot. Gard. 38: 33. 1951. Figure 12.

Vouapa Pittieri Rose, N. Am. Flora 23: 226. 1930.

Branchlets glabrous. *Petioles* 3-6 mm. long, glabrous. *Leaflets* 28-32.5 cm. long, 8.5-11 cm. wide, sessile, subequilateral, oblanceolate, the base inequilateral, the lower side obtuse and much wider than the acute upper side, the apex caudate-acuminate, the margin entire or irregularly undulate; upper surface glabrous, very minutely puberulous beneath on the costa and the primary veins, epunctate; costa salient above, the costa and primary veins salient beneath, the venules prominulous above, conspicuous beneath. *Inflorescences* to 3.5 cm. long, glabrous, the bracts 2.5 mm. long, 1 mm. wide, triangular, the pedicels about 4.5 mm. long; bracteoles 12 mm. long, 4 mm. wide, oblanceolate, concave, rounded-obtuse, glabrous. *Hypanthium* 10 mm. long on a 3 mm. stipe, glabrous. *Sepals* 17-18.5 mm. long, 4 mm. wide, oblong, obtuse, concave, sparsely and irregularly ciliolate, otherwise glabrous. *Petal* blade 42 mm. long, 15 mm. wide, elliptic, the claw 5 mm. long, glabrous externally, sparsely pilosulose within on the lower half of the costa. *Filaments* about 25 mm. long, villose basally, the anthers 5 mm. long, 2 mm. wide. *Stigma* capitate. *Style* 24 mm. long, pilosulose basally. *Ovary* 3-4 mm. long, 1-1.5 mm. wide, oblong, pilosulose on the margins, laterally glabrous, 6-ovulate; free portion of the gynophore 2 mm. long, pilosulose adaxially. *Fruit* glabrous, the seeds 3-3.5 cm. long, 2.5 cm. wide, obovate, the testa very membranous and venulose.

Type Collection: *H. Pittier* 4355, "Plain of Sperdi, near Puerto Obaldía, San Blas coast; near sea level," Panama, Sept. 1911 (HOLOTYPE US, isotypes F, GH, NY).

One might expect that this species would show greater relationship to the other Panamanian species than to any other. Such is not the case, however, for it is much more nearly allied to *M. archeri* of Colombia. From the latter it may be separated by its unguiculate, larger petal, its shorter hypanthium, its smaller glabrous bracteoles, and its caudate-acuminate leaflet apices.

Pittier published a description of *M. floridum* based on the specimen cited above (Contr. U. S. Nat. Herb. 18: 233. 1917) but Rose recognized that the material actually represented a new taxon. Consequently, he described it as a new species, basing it on Pittier's collection and naming it for the collector. It rested under the generic name *Vouapa* until Schery transferred it to the proper genus in 1951.

SPECIES DUBIA

1. *Vouapa simira* Aubl. Pl. Guian. 1: 27, pl. 8. 1775.

Vouapa violacea Lam. Encycl. 97. 1791.

Macrolobium Simira (Aubl.) Gmel. Syst. Nat. ed. 13. 2: 93. 1796.

Macrolobium sphaerocarpum Willd. Sp. Pl. 1: 186. 1797.

Aublet's plate representing this species shows unijugate leaves, the leaflets of which are equilateral and petiolulate. In addition to the foliage, only a single legume was depicted and this was orbicular in outline. The only recognized species possessing such leaflets is one from central Brazil, *M. arenarium*. In contrast to the orbicular legumes shown in Aublet's figure, the fruits of *M. arenarium* are elongate-oblong.

An isotype of *Vouapa simira* Aublet has been studied at the British Museum (Natural History) and I am certain that it represents no recognized species of *Macrolobium*.

NUMERICAL LIST OF TAXA

- | | | |
|--------------------------------|--------------------------------|-----------------------------|
| 1. <i>M. taxifolium</i> | a. var. <i>multijugum</i> | 32. <i>M. amplexans</i> |
| 2. <i>M. gracile</i> | b. var. <i>sinuatum</i> | 33. <i>M. suaveolens</i> |
| a. var. <i>confertum</i> | 17. <i>M. microcalyx</i> | a. var. <i>pakarimense</i> |
| b. var. <i>machadoense</i> | 18. <i>M. montanum</i> | b. var. <i>rondonianum</i> |
| c. var. <i>debile</i> | a. var. <i>montanum</i> | c. var. <i>petiolatum</i> |
| d. var. <i>gracile</i> | b. var. <i>potaroanum</i> | d. var. <i>uaupesense</i> |
| 3. <i>M. machaeroides</i> | 19. <i>M. urupaense</i> | e. var. <i>suaveolens</i> |
| 4. <i>M. brevense</i> | 20. <i>M. guianense</i> | 34. <i>M. parvifolium</i> |
| 5. <i>M. huberianum</i> | 21. <i>M. campestre</i> | 35. <i>M. palustre</i> |
| a. var. <i>pubirachis</i> | a. var. <i>arboresum</i> | 36. <i>M. savannarum</i> |
| b. var. <i>huberianum</i> | b. var. <i>medium</i> | 37. <i>M. pendulum</i> |
| 6. <i>M. longipedicellatum</i> | c. var. <i>campestre</i> | 38. <i>M. stenopetalum</i> |
| 7. <i>M. longeracemosum</i> | d. var. <i>arirambense</i> | 39. <i>M. stenosisiphon</i> |
| 8. <i>M. acaciaefolium</i> | e. var. <i>longibracteatum</i> | 40. <i>M. colombianum</i> |
| 9. <i>M. froesii</i> | 22. <i>M. arenarium</i> | a. var. <i>monagasense</i> |
| 10. <i>M. venulosum</i> | 23. <i>M. canaliculatum</i> | b. var. <i>metaense</i> |
| 11. <i>M. flexuosum</i> | 24. <i>M. punctatum</i> | c. var. <i>ocumarense</i> |
| a. var. <i>flexuosum</i> | 25. <i>M. unijugum</i> | d. var. <i>bicuspidum</i> |
| b. var. <i>parviflorum</i> | a. var. <i>janshawei</i> | e. var. <i>colombianum</i> |
| 12. <i>M. furcatum</i> | b. var. <i>mucronatum</i> | 41. <i>M. trinitense</i> |
| 13. <i>M. molle</i> | c. var. <i>unijugum</i> | 42. <i>M. stenocladum</i> |
| 14. <i>M. jenmanii</i> | 26. <i>M. klugii</i> | 43. <i>M. ischnocalyx</i> |
| 15. <i>M. discolor</i> | 27. <i>M. bifolium</i> | 44. <i>M. modicopetalum</i> |
| a. var. <i>discolor</i> | 28. <i>M. latifolium</i> | 45. <i>M. floridum</i> |
| b. var. <i>caudiculatum</i> | 29. <i>M. angustifolium</i> | 46. <i>M. obtusum</i> |
| c. var. <i>egranulosum</i> | 30. <i>M. retusum</i> | 47. <i>M. archeri</i> |
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